

RESOURCE ALLOCATION REVIEW BOARD (RARB)



12 February 2002

Jet Propulsion Laboratory
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TO: Distribution

FROM: E. S. Burke

SUBJECT: February 12, 2002 Resource Allocation Review Board (RARB) Meeting Minutes

The following are the Minutes of the NASA/JPL Deep Space Network (DSN) Resource Allocation Review Board (RARB) Meeting held at JPL on February 12, 2002. The purpose of this Review is to address the over-subscription of the DSN 26/34/70-meter tracking assets. The Review Board consists of Project Managers, Project Scientists, and key JPL Interplanetary Network Directorate (IND) Deep Space Mission System (DSMS) Managers or their representatives. The Board is responsible for reviewing new or changed requirements, adopting recommendations to reduce periods of heavy contention, and for controlling changes to requirements. This Review addressed contention in 2003, 2004, and 2005.

Review Board Members

The following Review Board Members or their representatives were in attendance:

Bill Weber	JPL	Chairman / Director for Interplanetary Network Directorate
Gene Burke	JPL	DSMS Resource Allocation Planning & Scheduling Office
Al Cangahuala	JPL	Reference Frame Calibration Project Manager
Peter Doms	JPL	Deep Space Mission System (DSMS) Manager
John Eichstedt	SPL	STEREO Project Representative
Jim Erickson	JPL	Mars Exploration Rover (MER) Project Representative
Bob Farquhar	APL	MESSENGER Mission Manager, CONTOUR
Roger Gibs	JPL	Mars 2001 Odyssey Deputy Project Manager
Ed Hirst	JPL	Genesis Project Representative
Dwight Holmes	JPL	INTEGRAL, Rosetta Representative
Richard Horttor	JPL	Mars Express Orbiter Project Manager
Mike Klein	JPL	Radio Astronomy Project Manager
Ron Mahmot	GSFC	Space Science Mission Operations Project Manager
Robert Mase	JPL	Mars 2001 Odyssey, Global Surveyor Mission Representative
Ed Massey	JPL	Ulysses/Voyager Project Manager
John McKinney	JPL	Deep Impact Project Representative
Rich Miller	JPL	DSMS Plans & Commitments Office Manager
Bob Mitchell	JPL	Cassini Project Manager
Steve Ostro	JPL	GSSR Project Scientist

Bob Ryan	JPL	Stardust Project Representative
Chet Sasaki	JPL	Genesis Project Manager
Rance Skidmore	Omitron	GOES Project Manager Representative
Martin Slade	JPL	GSSR Project Manager
Ed Smith	JPL	Ulysses Project Scientist
Joel Smith	JPL	Muses-C, US Space VLBI Project Manager
Joe Statman	JPL	DSMS Engineering Program Office Manager
Eileen Theilig	JPL	Galileo Project Manager
Joe Wackley	JPL	DSMS Operations Office Program Manager
Greg Wright	MSFC	Chandra Project Manager Representative

Review Materials

These Minutes include the material included in the bound handout book, as well as the presentations distributed at the RARB:

Agenda

1. Introduction **B B. Weber**
2. Overview, Action Items, Contention Summary **B G. Burke**
3. NASA Office of Space Science Code S – B. Geldzahler
4. JPL DSMS Plans & Commitments Program Office – R. Miller
5. JPL DSMS Engineering Program Office **B J. Statman**
6. JPL DSMS Operations Program Office – A. Berman
7. New Horizons – R. Farquhar
8. ST-5 – I. Bibyk
9. Resource Contention 2003-2012 – N. Lacey (Updated Red Book Information)
10. Contention Resolution
11. Action Items

Introduction B Bill Weber, RARB Chairman

After welcoming the participants, he shared his understanding of the importance of this semi-annual review of DSN loading. It is a classic supply and demand problem. In the 1980's, there were only 10-15 spacecraft using the Network. Now, there are 62 users listed in this Review that plan on using the DSN over the coming years. The DSN is trying to augment its supply of antenna resources to satisfy this demand. NASA HQ has approved significant funding to help alleviate over-subscription in 2003-2004. The DSN has requested additional funding to augment its current antenna network and to provide for future growth. This resource allocation process has proven itself able to work with a large number of users over many years. In spite of the increasing demand and the limited supply of antennas, we have never had an appeal go all the way to NASA Headquarters. This speaks highly of our DSN community.

Overview, August '01 Action Item Review, Contention Summary - E. Burke

The Agenda was reviewed and the Review Board introduced. The Action Items from the August 13, 2001 RARB were reviewed. Nine of the ten Action Items have been closed; two of these have new recommendations as part of this RARB. One Action Item will be closed by June 2002. Overall loading throughout the next ten years, as shown on the accompanied charts, indicates continued high usage of the DSN.

NASA Office of Space Science Code S – B. Geldzahler

Management and funding of the DSN is in transition at NASA Headquarters. Congress has mandated this change in the latest approved NASA appropriations bill. The Office of Space Science will eventually have both management and budget authority of the DSN. This makes sense in that most of the users of the DSN are out of Code S.

A Space Communications Coordination and Integration Board has been established and will coordinate and integrate cross-cutting issues that affect all of NASA. Issues such as communication standards, technology funding that avoids duplication, and spectrum management are just a few of the areas that will be addressed.

A Prioritization Board has been established to help resolve conflicts and provide guidance during the 2003-2004 crunch period. The RAPSO process will continue to be used and this HQ team will be there to assist in any elevated impasse.

An Executive Management Board has been established to help determine upgrades and operations issues. Every six months this board will convene to weigh options for future DSN initiatives.

The Office of Space Science has held and is planning future reviews. A senior review of Astronomy and Physics Operating Missions will be held this summer. The Planetary Data System was reviewed in November 2001.

JPL DSMS Plans & Commitments Program Office – R. Miller

To help alleviate over-subscription in 2003-2004, additional plans are in the works to augment the DSN. One area is to develop alternate assets, another is what precautions (or triage) can be set up in order to protect the support of key mission events.

Presently, two alternate assets are identified in Australia that could augment our Canberra complex. New Norcia, an ESA 35-meter antenna with full S and X-band frequency support, will implement command and telemetry support that will be tested by Ulysses. The primary missions that are planned for support are ESA's own Rosetta and Mars Express spacecraft. Therefore, no planned DSN mission support will be scheduled. Only DSN failure or spacecraft emergency may prompt its usage. The Parkes 64-meter Radiotelescope may again be used by the DSN. Voyager 2 and Galileo have used Parkes effectively. Negotiations are in process so that it can be used for telemetry-only support. The intended usage would be for DSN failure or spacecraft emergency. It would be on-call, but would be scheduled during the most critical periods. Most Projects that have critical support during this period have been polled as to what could be provided that would help them out the most.

Another area of support is to determine what kinds of contingencies or problems that may occur can be remedied by use of arraying multiple antennas at a DSN complex. This type of triage support needs to be defined and negotiated ahead of time. It is important that this is understood, coordinated and tested prior to initiating this remedy.

JPL DSMS Engineering Program Office - J. Statman

This report focused on tasks recently completed, planned to be completed prior to the '03-'04 heavy loading, and those tasks planned for after FY03. The decommissioning of the 11m subnet was noted.

Tasks either completed or nearly completed were reviewed. The 26m Automation Task is nearing completion with D3.1 due in 4/02. The 70m X-band Uplink is complete with the last 20 kW transmitter installed at MDSCC in 10/01. Network Monitor and Control (NMC) 1.3 and 1.3.1 were deployed and implemented an

ability to automate setup and breakdown for tracking passes. Uplink D2 replaced aging hardware and software for the 34m and 70m antennas. Arraying at GDSCC was just implemented this month.

Many tasks are planned to be completed prior to the '03-'04 overload. The 34-meter Ka-band downlink task will initially implement new feeds for all the existing BWG antennas. What is very important to all users is that this modification will allow all 34BWG antennas to have equal signal sensitivity to the 34HEF subnet. The 34BWG antennas will install new 20 kW X-band transmitters that will provide equivalent uplink power to all X-band uplink antennas. Two-channel MSPA will add some automation features to our current capability. Arraying capability will be added to both Madrid and Canberra. Delta-Differenced One-Way Ranging (Delta DOR) will become operational by mid-2003 and was successfully used by Mars Odyssey. The Network Simplification Project (NSP) will remove and replace current telemetry, command and ranging equipment for the 34/70m antennas except at DSS-27. NMC 1.4 will add a remote monitoring capability for the 34/70m antennas. Turbo code is a new error-correcting code that will functionally replace the MCD3 with better gain and will be implemented by September 2003.

Tasks that will be completed after FY03 are the X/X/Ka-band feeds for the remaining 34BWG antennas, Antenna Controllers for the 70m and 34BWG antennas, and the 70m refurbishment.

JPL DSMS Operations Program Office – A. Berman (for J. Wackley)

The performance continues to meet customer data requirements. Recent actions taken to strengthen Operations include additional staff, increasing overseas communications bandwidth, and completely updating the DSN Operations Standard Operations Plan. Two new working groups were initiated to improve logistics awareness and operations leadership.

The forecast for Operations in 2002 includes only two major launches (Contour and Integral), but numerous Engineering to Operations deliveries. The 2003/2004 overload will be an unforgiving environment for Operations with new task deliveries, numerous spacecraft in the same view (up to 6 at Mars), and interfacing with non-DSN stations. MSPA operations will inherently be complicated with multiple critical activities planned for every pass.

The Operations budget is increased to fortify our existing capability by adding new staff positions in Pasadena, software upgrades to NSS, and an increased number of Complex maintenance personnel. Additional measures will be explored to increase operational robustness.

New or Modified Projects Requirements

New Horizons – R. Farquhar

Even though the new Presidential budget does not include funding for New Horizons, Congress may help with a new program initiative called New Frontiers. Some of the key characteristics of this mission are a launch in January 2006, and flight time to Pluto of 10.5 years. A Jupiter Flyby ($\sim 40 R_J$) in March 2007, provides the necessary boost to achieve the flight time. To save on operations budget, annual periods of hibernation with annual 50-day checkouts provide flexibility and cost constraint. A combination of 34m and 70m support will be necessary. Applied Physics Laboratory (APL) staffing considerations work well with plans for Contour and Messenger.

The Solar Probe Mission is under study with a Launch in June 2010, Jupiter Flyby in August 2011, and then a Sun Encounter in January 2014. Closest Approach is $4 R_S$.

ST-5 – I. Bibyk

Space Technology-5 is a secondary payload candidate and is composed of three spacecraft using the same carrier frequency (near-Earth X-band frequency), but using three different spacecraft IDs. The constellation orbit of the three spacecraft will be approximately 10.5 hours with about 20-30 minutes of tracking support required per spacecraft, per orbit. The first two weeks will have numerous attitude and maneuvers. The spacecraft are designed for a three-month mission. Launch Readiness is planned for May 31, 2004. The 34BWG antenna subnet is expected to support the mission.

Resource Contention Summary – N. Lacey

Presentations were made regarding the Loading Study Initial Conditions, and the Changes in Project Requirements. The approach used in identifying and evaluating contentions for this Review has changed. For the years addressed at this Review, each month is evaluated for contentions. There is a description of critical events, an analysis of potential problems, and proposed recommendations listed for each month. Background/source information is also shown (view the *“Red Book”* by clicking the link).

Following are the results from the RARB negotiations described in detail, which will be used as the new baseline for DSN resource allocation.

February 12, 2002 RARB Contention Resolution Minutes**2003 Contention Period - January - Weeks 01 - 05**

During the GWE in Weeks 01 to 03, Cassini agreed to use 12 hours at DSS-25, 8 hours at DSS-54, and 4 hours at DSS-45, to help resolve moderate contention in these weeks. Cassini commented that during the GWE support, it has a 10-degree elevation, and a requirement for 2-way support.

DSN agreed to reduce Antenna Cals from 8 hours to 4 hours in Week 01 through Week 03. DSN agreed to delete CAT M&E D-M4 24-hour support at DSS-15\45 in Week 02.

Note: C. Jacobs made a strong argument against reducing CAT M&E and Clock Sync activities stating that two Clock Sync supports per month are needed to meet essential Delta DOR requirements in 2003. *Action Item (AI) #10* was assigned to C. Jacob, to evaluate the magnitude of error caused when Clock Sync supports are scheduled at intervals of less than 2 tracks per month. In addition, Rich Miller was assigned *AI #2* to investigate the availability of using alternate antenna assets for conducting Catalog M&E and Clock Sync supports.

Ground-Based Radio Astronomy (GBRA) agreed to delete DSS-14\63 VLBA SOC-M4 in Week 01; GBRA agreed to reduce DSS-45 Host Country support to 8 hours in Week 02; GBRA agreed to delete DSS-63 Host Country support in Week 03; GBRA agreed to reduce Planet R/Astronomy and M-Wave Spect from 9 hours to 4 hours in weeks 01 through 05; GBRA agreed to delete DSS-63 RA360 H20 in weeks 01 through 05, and to delete DSS-14\63 RA500 SOC-M4 in Week 05.

Galileo agreed to change support to five 8-hour and two 6-hour passes at DSS-14, and seven 7-hour passes at DSS-63 in Week 01. Galileo agreed to change support to four 7-hour and three 5-hour passes at DSS-14, and to change support to one 10-hour, two 7-hour and three 5-hour passes at DSS-63 in Week 02. Galileo did not agree to receive requested support using DSS-14 in Week 03. However, after discussions, Galileo agreed to accept two 8-hour passes at DSS-63 and three 8-hour passes at DSS-14.

Mars Odyssey agreed to accommodate Galileo's end of routine support in Week 03 on DOY 015 by reducing support this month at DSS-63 and 14, Monday through Wednesday and increasing support Thursday through Sunday. Mars Odyssey agreed to change to five 7-hour and one 4-hour passes at DSS-14, and six 8-hour and one 4-hour pass at DSS-63 in Week 01, to accommodate DSS Maintenance. In addition, Mars Odyssey agreed to reduce support at DSS-63 Monday through Wednesday for Galileo, and to increase support Friday through Sunday at DSS-63 in Week 03.

Mars Global Surveyor agreed to change 6 of 14 passes from the 34HEF to MSPA with Mars Odyssey at DSS-63, and to use DSS-15 and DSS-45 to support the remaining 8 Mars Global Surveyor passes.

MEGA agreed to delete support in Weeks 02 to 04.

Space Geodesy Program (SGP) did not accept the recommendation to delete all support in Weeks 01 to 05. Nap Lacey was assigned *AI # 3* to work with P. Wolken and G. Martinez, to reduce support or replan coverage.

SIRTF agreed to change continuous support in Weeks 02 – 03 DOY 014 from DSS-25, 34, and 54 to DSS-15, 34, and 63. SIRTF agreed to change continuous support in Week 03 (DOY 015) from DSS-25, 34, and 54 to DSS-25, 34, and 63. SIRTF also agreed to change continuous support in Weeks 04 - 05 from DSS-25, 34, and 54 to DSS-25, 34, and 54. Pat Beyer raised a concern regarding the use of the 20kW transmitter at DSS-63 potentially saturating the spacecraft receiver. *Action Item #4* is assigned to Pat Beyer to investigate the use of the 20kW transmitter at DSS-63 for the uplink, and to perform a link analysis to determine its impact.

SOHO HSO agreed to requested support on best efforts basis and will accept incurring gaps in HSO continuous support.

Ulysses agreed to move all support to DSS-14, DSS-15, and DSS-24 using two 5-hour split passes per day as required.

Voyager 1 agreed to requested support using DSS-15 and DSS-25.

2003 Contention Period - February - Weeks 06 - 09

Chandra agreed to move nine 2-hour passes to the 26m.

DSN did not accept the recommendation to delete Antenna Calibration in Weeks 06, 07 and 09. *Action Item # 5* was assigned to Mike Wert to investigate impact of reducing Antenna Calibration supports. Note: N. Lacey later changed the deletions of Antenna Calibration to 4-hour reductions.

DSS agreed to move DSS-24 maintenance support to Tuesday.

GBRA agreed to reduce DSS-63 M-Wave Spect, Planet R/Astronomy, and RA360 H2O MSR supports to 4 hours. GBRA agreed to delete VLBA SOC-M4 at DSS14\63 in Week 06.

GSSR agreed to reduce Orbital Debris at DSS-14/15 to 4 hours in Weeks 07 and 09.

Mars Global Surveyor agreed to MSPA 7 passes at DSS-14 and 63 in Week 06 and 08, and to MSPA three passes at DSS-43 in Weeks 07 and 09 with Mars Odyssey. MGS will still attempt to meet its requirement of 12 hours of contiguous support. In addition, Mars Global Surveyor agreed to accommodate Voyager 1 MAGROL in Week 06.

Mars Odyssey agreed to MSPA 7 passes at DSS-14 and 63 in Week 06 and 08, and to MSPA 3 passes at DSS-43 in Week 07 and 09 with Mars Global Surveyor. In addition, Mars Odyssey agreed to accommodate Voyager 1 MAGROL in Week 06.

MEGA agreed to delete support in Week 07 and 08.

SOHO HSO agreed to requested support on best efforts basis and will accept incurring gaps in the HSO continuous support.

SIRTF agreed to use 7 passes at DSS-25, and to use 14 passes at DSS-34, 45, 54, and 63 in Week 06. In addition, SIRTF agreed to use DSS-15, 45, and 54 in Weeks 07 to 09.

Ulysses agreed to move all support to DSS-14, 15, and 24 using two 5-hour split passes per day as required.

Voyager 2 agreed to move routine support from DSS-43 to DSS-34 and DSS-45 in Weeks 07 to 09.

2003 Contention Period - March - Weeks 10 - 13

Cassini agreed to reduce support to 8 hours and use DSS-45 only.

DSN did not accept the recommendation to delete Antenna Cals in Week 10 and 11. See AI # 5. Note: N. Lacey later changed the deletions of Antenna Calibration to 4- hour reductions.

GBRA agreed to delete DSS-45 Host Country support in Week 13.

MEGA agreed to delete support in Weeks 10, 11 and 12.

Mars Global Surveyor agreed to change Mapping/Beta supplement passes to MSPA with Mars Odyssey at DSS-14, 43, 45, and 65. In addition, Mars Global Surveyor agreed to accommodate Voyager 1 ASCAL, MAGROL, and DTR P/B.

Mars Odyssey agreed to MSPA with Mars Global Surveyor and accommodate DSS Routine and Bearing Maintenance by planning short passes on maintenance days and long passes on non-maintenance days. In addition, Mars Global Surveyor agreed to accommodate Voyager 1 ASCAL, MAGROL, and DTR P/B.

SGP did not accept the recommendation to delete Crust Dyn at DSS-45 in Week 10, and to delete Crust Dyn at DSS-65 in Week 11. Reference AI # 3.

SOHO agreed to delete TSO support and restore routine coverage in Week 13. In addition, SOHO agreed to accommodate 26m DSS Maintenance.

Ulysses agreed to move all support to DSS-14 and DSS-24 using two 5-hour split passes per day as required.

Voyager 1 agreed to reduce DSS-14 negotiated passes to 4 hours in Week 10.

2003 Contention Period - April - Weeks 14 - 17

Cassini agreed to use DSS-45 and reduce support to 8-hours in Week 14 and 15.

Cluster 2 agreed to exclude use of DSS-46 in Weeks 15 through 17.

DSN did not accept the recommendation to delete Antenna Calibration in Week 14 and 15. *Refer to AI # 5.* N. Lacey later changed the deletions of Antenna Calibration to 4-hour reductions.

DSS agreed to move DSS-24 Maintenance to Tuesday in Week 16 and delete DSS-46 Maintenance in Weeks 15 to 17.

GBRA agreed to delete DSS-43 and DSS-63 Host Country 24-hour support in Week 16 and 17, and to delete M-Wave Spect & Planet R/Ast in Weeks 14 to 16.

Geotail agreed to exclude use of DSS-46 in Weeks 15 to 17.

GSSR Mercury agreed to reduce support to 4 hours.

Mars Global Surveyor agreed to change Mapping/Beta supplement passes at DSS-65 to 7 hours & MSPA with Mars Odyssey at DSS-14, 43, 45, and 65 in week 14 only.

Mars Odyssey agreed to change passes to MSPA with Mars Global Surveyor at DSS-14, 43, 45, and 65 in week 14 only.

MEGA agreed to delete support in Weeks 14 to 16.

Polar agreed to exclude use of DSS-46 in Weeks 15 to 17.

SGP did not accept the recommendation to delete DSS-65 Crust Dyn B-M4 24 hour support in Week 14, and to delete DSS-45 Crust Dyn W-M4 18-hour support in Week 15 and 16. *Refer to AI # 3.*

SOHO agreed to exclude use of DSS-46 beginning Week 15. SOHO did not accept the recommendation to delete TSO support in Week 17, but agreed to keep support on a best effort basis while incurring gaps. Ulysses agreed to move all support to DSS-14 and 24 using two 5-hour split passes per day as required.

Voyager 1 agreed to delete routine support at DSS-14 and 45 in Week 14. Voyager 1 agreed to delete routine support at DSS-14, 43 in week 15 and 16, and to delete DSS-14 and DSS-63 support in Week 17. In addition, Voyager 1 agreed to use planned 8-hour passes at DSS-26. Note: Voyager 1 acceptance of DSS-26 support is contingent upon DSS-26 availability, and if support cannot be met at DSS-26 Voyager 1 will receive support by an alternate DSN antenna.

2003 Contention Period - May - Weeks 18 - 22

The proposed DSS-46 servo hydraulic drive replacement downtime in Week 18 was approved. To support the downtime effort DSS Maintenance agreed to reduce DSS-16 and DSS-27 maintenance to 6 hours each in Weeks 18 through 20.

Geotail agreed to move support in Week 18 from DSS-46 to DSS-16, 27, and 66 to accommodate DSS-46 servo hydraulic drive replacement downtime.

Polar agreed to move 7 real-time and 7 playback passes from DSS-46 to DSS-16, 27 and 66 and to move 11 playback passes to the 34B1 in Week 18. In addition, Polar agreed to move 11 playback passes to the 34B1 in Week 19 and 20 to accommodate DSS-46 servo hydraulic drive replacement downtime.

SOHO agreed to reduce the 9.6-hour passes to 6 hours each and to schedule three 1-hour ranging passes using the 34B1 in Weeks 18 through 20. In addition, SOHO agreed to move the reduced 6-hour passes in

Week 18 to DSS-16, 66 and the 1.6-hour passes to DSS-16, 27 and 66 to accommodate DSS-46 servo hydraulic drive replacement downtime.

WIND agreed to reduce three 5-hour passes at 34B1 to 4 hours each in Weeks 18 through 20.

2003 Contention Period - June - Weeks 23 - 26

DSS Maintenance agreed to move DSS-24 maintenance in Week 24 to Tuesday to accommodate the Genesis maneuver on DOY 161.

Mars Global Surveyor agreed to delete four 12-hour passes on the 34HEF in Week 26 and to MSPA 4 additional 7-hour passes with Mars Odyssey at DSS-25, 34, and 54 to resolve contention with MER-A/B and Mars Odyssey.

Mars Odyssey agreed to reduce the number of stand-alone passes at DSS-25, 34, 54 from 11 to 7 and to MSPA 4 additional passes with Mars Global Surveyor.

2003 Contention Period - July - Weeks 27 - 31

GBRA agreed to move DSS-45 Host Country support from Week 29 to Week 30.

Goldstone Solar System Radar did not accept the recommendation to reduce the Mars observations in Week 30 to 3-4 hours and to delete the observation in Week 31. Goldstone Solar System Radar stated that the observations are dependent on the Mars Exploration Rover landing site selections and that GSSR will work internally with the Mars Program Office under AI # 7 to resolve contention in these weeks.

Voyager 2 agreed to reduce two DSS-45 passes in Week 29 to 5 hours and to support the remaining 5 passes at DSS-43.

2003 Contention Period - August - Weeks 32 - 35

Goldstone Solar System Radar did not accept the recommendation to delete the Mars observation in Week 33 and stated the observation is dependent on the Mars Exploration Rover landing site selections. Contention between the Goldstone Solar System Radar Mars and Asteroid 1994PM observations at DSS-14 on DOY 225 and with Mars Odyssey support at DSS-25 will be resolved with the Mars Program Office under AI # 7.

Mars Global Surveyor agreed to move 9-10 MSPA passes with Mars Odyssey from DSS-24, 34, 63 and DSS-25, 34, 63 to DSS-24, 25, 34 to Week 32 and 33. Mars Global Surveyor agreed to reduce three DSS-63 passes to 7 hours and to MSPA with Mars Odyssey using DSS-63 in Week 35. In addition, Mars Global Surveyor agreed to support the remaining 7 stand-alone passes at DSS-25, and 34.

Mars Odyssey agreed to move 9-10 MSPA passes in Week 32 and 33 from DSS-24, 34, 63 and DSS-25, 34, 63 to DSS-24, 25, 34. In addition, Mars Odyssey agreed to MSPA 3 DSS-63 passes with Mars Global Surveyor in Week 35.

MER-A agreed to move 4 cruise passes in Week 32 from the 34HEF to DSS-25, and 43 to resolve contention between MER-A and MER-B on the 34HEF.

MER-B agreed to move five 34HEF checkout passes in Week 32 to the 70m and to Delete the DSS-15\45, 15\65 1-hour VLBI request and include VLBI support into the overlap between 2 checkout passes. MER-B agreed to move 3 cruise passes in Week 33 to DSS-24, 25, and 34 and to modify the Cruise/VLBI request to use DSS-14, 15, 24, 25 for the 9-hour passes and DSS-45, 43, 65, and 63 for the 8-hour passes.

2003 Contention Period - September - Weeks 36 - 39

Goldstone Solar System Radar did not accept the recommendation to reduce the Mars observation on DOY 245 to 3 hours to resolve contention with the Mars Exploration Rover B EDL test. Goldstone solar system radar stated that the observation is dependent on the Mars Exploration Rover landing site selections and that GSSR will work internally with the Mars Program Office to resolve contention under *AI #7*.

MER-A agreed to move 3 cruise passes in Week 36 and 37 to 34B1 antennas.

Mars Global Surveyor agreed to MSPA 9-10 passes with Mars Odyssey in Weeks 36 to 38 using DSS-43 and DSS-63 while reducing MSPA pass duration to 7 hours. In addition, Mars Global Surveyor agreed to schedule nine to ten 4-hour passes at the 34B1.

Mars Odyssey agreed to MSPA 9-10 passes in Weeks 36 to 38 with Mars Global Surveyor at DSS-43 and 63.

Nozomi agreed to move Week 38 support from DSS-43 or 34 to DSS-34 only.

2003 Contention Period - October - Weeks 40 - 44

October was not addressed at the RARB. Analysis showed that user contention and unsupportable time was within workable levels and contention should resolve during final schedule preparations and negotiations.

2003 Contention Period - November - Weeks 45 - 48

ACE agreed to move 4-5 passes to DSS-46 and 66 in Weeks 45 through 47 to resolve contention with 26-meter users.

Goldstone Solar System Radar agreed to delete the Asteroid 1996GT observation in Week 46 to resolve contention with the Mars Exploration Rover B EDL test on DOY 317.

Mars Express agreed to move all support in Week 47 to DSS-55 using three 8-hour and four 9.9-hour passes at DSS-55 to resolve contention with other Mars viewperiod users on the 70m and 34m subnets.

Mars Global Surveyor did not accept the recommendation to reduce from eight 10-hour passes to seven 4-hour MSPA passes with Mars Odyssey in Week 47 and to schedule seven 4-hour stand-alone passes using DSS-25, 26, 55. The Mars Program Office accepted an action under *AI # 6* to investigate and provide a resolution.

Mars Odyssey did not accept the recommendation to use 4 passes at DSS-63 and to receive the remaining support using DSS-14, and 43 in Week 46. Mars Odyssey did not accept the recommendation to reduce from eight 10-hour passes to seven 4-hour MSPA passes with Mars Global Surveyor and seven 4-hour stand-alone passes in Week 47. The Mars Program Office accepted an action under *AI # 6* to investigate and provide a resolution.

MER-B agreed to move four TCM passes from the 34H to 70m antennas in Week 47.

Nozomi agreed to use DSS-34 for two routine passes in Week 47.

Voyager 1 agreed to delete support at DSS-43, 54 in Weeks 47 and 48 using the seven 8-hour passes planned at DSS-26 for support.

Voyager 2 agreed to reduce three DSS-34 passes in Week 47 to 4 hours and to move support to DSS-43 and 45.

2003 Contention Period - December - Weeks 49 - 52

DSS Maintenance agreed to reduce DSS-16 and DSS-66 support to 6 hours in Weeks 50 and 51. DSS Maintenance did not accept the recommendation to adjust maintenance requests for support in the RAP database to match the DSN maintenance holiday schedule. Week 52 maintenance at DSS-15, 24, 45, 54, and 55 shall remain in the plan as requested.

Gravity Probe B agreed to move Week 51 support to Week 49.

Mars Global Surveyor, Mars Odyssey and Nozomi did not accept the recommendations in Weeks 50 through 52. The Mars Program Office will work internally under *AI # 6* to investigate and provide a contention resolution for this period.

MER-B agreed to move 4 approach/VLBI passes from the 34B1 to 70m antennas; two 8-hour passes to DSS-43 and 63 and two 9-hour passes to DSS-14. MER-B also agreed to move two approach passes from DSS-15 to DSS-14 in Week 52.

SOHO agreed to reduce three 9.6-hour passes to 6-hours each in Weeks 50 through 52.

Voyager 2 agreed to reduce two 5-hour passes at DSS-34 in Weeks 49 and 51.

2004 Contention Period - January - Weeks 01 - 05

Cassini did not accept the recommendation to reduce DSS-45 support to 4-hours, to increase DSS-25 8-hour supports to full view (10-12 hrs), and to reduce DSS-65 8-hour supports to 6-7 hours in Weeks 01 to 04, and did not accept incurring daily gaps of 1-4 hours at the Canberra/Madrid overlap. This was to accommodate MER-A/B and Deep Impact during Cassini's Gravity Wave Experiment (GWE) continuous support at DSS-25, 45, and 65. Cassini Project Manager (R. Mitchell) stated that incurring gaps in the GWE data during the December 2003 through January 2004 time frame is not accepted and he will investigate the possibility of moving the GWE earlier by 4-8 weeks, into the November 2003 time frame, or moving the GWE later into the February 2004 time frame.

Cluster 2 agreed to delete DSS-15 and 45 from SSO Array supports in Weeks 02-05 to accommodate MER-A/B Approach, VLBI, EDL, and Surface Ops.

Deep Impact agreed to reduce DSS-15 supports from 8 hours to 4 hours and to increase pass duration to full view (10-12 hours) at DSS-34 and 54 in Week 01. Deep Impact agreed to use DSS-24 instead of DSS-15, and to use split passes of 4 - 5 hours at DSS-54 and 55 in Weeks 02 to 04, to maintain continuous coverage. Deep Impact agreed to requested support at DSS-34 to accommodate Cassini GWE and the Mars Projects busy period for Approach, VLBI, EDL, and Surface Ops and for Stardust Comet P/Wild 2 Encounter and Playback.

DSN Antenna Calibration agreed to delete support in Week 01 and to reduce support from 8 hours to 4 hours in Weeks 02, 03, and 05. The recommendation is to reduce contention on the 70m and 34HEF during the Mars Projects busy period for Approach, EDL, and Surface Ops

DSN Clock Sync VLBI agreed to move support from Week 02 to Week 04 to reduce contention on the 70m and 34HEF during the Mars Projects busy period for Approach, EDL, and Surface Ops. *Action item # 4* is

assigned to M. Wert to assess the impact of moving, reducing, and deletion of Clock Sync VLBI Calibrations to the source catalogue in support of MER-A/B Delta DOR Campaign.

Ground Base Radio Astronomy (GBRA) agreed to schedule the 24-hour Host Country at DSS-43 in three 8-hour increments and to move support to Week 05. M-Wave Spect agreed to delete support in Week 01 and 02, to reduce three 6 to 9-hour supports to 4 hours in Week 03 and 04, and to reduce three 6-hour supports to two 4-hour passes in Week 05. To help reduce contention on the 70m during the Mars Projects busy period for Approach, VLBI, EDL, and Surface Ops, Planet R/Ast agreed to delete support in Week 01 and 02 and to reduce Weeks 04 and 05 supports to 4 hours (Week 03 is 4 hours).

Gravity Probe B agreed to move support from Week 01 to Week 05 to reduce contention on the 70m during the Mars Project busy period for Approach, VLBI, EDL and Surface Operations Gravity.

Goldstone Solar System Radar agreed to reduce two 8-hour Asteroid Minos supports to 5 hours in Week 05, and to reduce Mercury observation support from 6 hours to 4 hours in Week 02. The recommendation is to reduce contention on the 70m during the Mars Project busy period for Approach, VLBI, EDL and Surface Operations Gravity.

MAP agreed to move all supports to DSS-43 and 63 in Weeks 02 to 05 to reduce contention at DSS-14 during the Mars Projects busy period for Approach, VLBI, EDL, Surface Operations and Stardust Comet P/Wild 2 Encounter and Playback.

Mars Odyssey did not accept the recommendations for reduction of support in weeks 01 to 05. *Action Item # 7* is assigned to the Mars Program Office, Charles Whetsel to work internally with MER-A/B to secure coverage for Mars Odyssey in Week 02 and to investigate the feasibility of using 34M MSPA supports with Mars Global Surveyor in Week 03 to 04, to determine the landing sites for MER-A/B and to evaluate/determine MSPA and stand-alone support for Mars Odyssey. *Action Item # 6* is assigned to MER-A/B (J. Erickson) to workout support strategy to accommodate Mars Odyssey in Week 01.

MER-A accepted the recommendation for Approach/VLBI passes in Week 01 to use 10-hour supports at DSS-14, reduce 8-hour DSS-43 and DSS-63 supports to 7 hours, and to delete requests for 34HEF. MER-A accepted the recommendation to reduce one 70m 8-hour MER-A/Mars Odyssey MSPA support to 5 hours in Week 05. MER-A did not accept the recommendation to delete the requirement for 34HEF hot-backup coverage for TCMs (two passes) in Week 01. *Action Item # 9* was assigned to MER-A to assess the possibility of releasing the 34HEF hot-back coverage requirement. MER-A did not accept the recommendation to MSPA with Mars Odyssey and to accommodate DSS Maintenance by reducing one DSS-14 support by 5 hours, one DSS-43 support by 3 hours, and one DSS-63 support by 4 hours in Week 04, citing the landing sites have not been determined. The Mars Program Office (Charles Whetsel) accepted *AI # 7* to work the contentions in the December 2003 through February 2004 time frame internally with the other Mars Projects to ensure that all Mars Missions have sufficient coverage and to determine the MER-A/B landing sites.

MER-B agreed to move DSS-15 Approach and Approach/VLBI support to DSS-26 in Week 01 to accommodate MER-A and Cassini on the 34HEF. MER-B agreed to use DSS-15 and DSS-26 for Approach and Approach/VLBI support in Week 02. MER-B agreed to use DSS-15, 26 for Approach and

Approach/VLBI support in Week 03, but placed emphasis on maintaining its hard requirement for one 70m pass per day.

Mars Odyssey and MER-A did not accept recommendation in Week 04 and accepted an action under *AI # 6* to investigate the Mars Odyssey/MER-A contention and provide resolution for the December 2003 through February 2004 time period.

Mars Global Surveyor did not accept the recommendation in Week 02 for the 34B1 TCM support to use 4-hour split passes, delete stand-alone Mapping support on the 34B2, and to use four planned MSPA supports with Mars Express on DSS-26, 55. The Mars Project Office accepted an action under *AI # 6* to investigate contention and provide resolution. Mars Global Surveyor did not accept the recommendation in Week 04 to delete two DSS-26 stand-alone Mapping supports; use 4 planned MSPA supports with Mars Express and to use three 4-5 hour split passes at DSS-34, 45. The Mars Project Office accepted an action under *AI # 7* to investigate contention and provide resolution. Mars Global Surveyor agreed to use four 5-hour split passes at DSS-26 and 55 for TCM support in Week 03. Mars Global Surveyor agreed to use four 5-hour split passes at DSS-26 and 55 for Mapping support in Week 05.

POLAR agreed to move four 26m Real Time (R/T) passes and four 26m Playback (P/B) passes to DSS-27.

SOHO agreed to move four 6-hour 26m supports to DSS-27.

Stardust accepted the recommendation in Week 01 and agreed to increase six 8-hour supports to 9 hours and to use DSS-43; agreed to reduce six 8-hour passes to 6 hours at DSS-14, and DSS-63; agreed to retain one 8-hour pass at DSS-14; agreed to retain planned 4-hour supports at DSS-14 and at DSS-63 to accommodate MER-A and Mars Odyssey on the 70m. Stardust agreed to requested support in Week 02 and 03 and will use full view (10 - 12 hours) at DSS-43 and 7-hour supports at DSS-14 and DSS-63.

Ulysses agreed to change seven 10-hour passes to (14) fourteen 5-hour split passes using DSS-24, 15, and 34 in week 01 to accommodate Wind. Ulysses agreed to change four 10-hour passes to eight 5-hour split passes at DSS-54 and 24 in week 02 to accommodate WIND. Ulysses agreed to reduce continuous support to 16 hours U/L and D/L per day in week 04 and 05. Ulysses stated it would like to maintain continuous coverage on a best effort basis incurring gaps.

Voyager 2 agreed to change all supports to two 4-hour split passes per day (fourteen 4-hour passes per Week) at DSS-43, 45, and 34.

WIND agreed to move the TCM support from Weeks 01 and 02 to Weeks 05 and 06 and to reduce routine support to 4 hours each to accommodate Genesis routine and Maneuver support and Ulysses.

2004 Contention Period - February - Weeks 06 - 09

DSN Cat M&E agreed to use two split supports of 12-hour increments each for Cat M & E in week 06 during the MER-A and MER-B high activity period.

DSS Maintenance agreed to reduce one routine 8-hour support at DSS-14 to 6 hours in Week 09 to accommodate Mars Odyssey stand-alone, Mars Odyssey/MER-A and Mars Odyssey/MER-B MSPA supports on the 70m.

EVN agreed to requested support using three 8-hour supports in week 09 during the MER-A and MER-B high activity period.

Ground Base Radio Astronomy Host Country agreed to change support to two 8-hour supports to reduce contention during the MER-A and MER-B high activity period.

RA500 agreed to requested support using three 8-hour increments to reduce contention during the MER-A and MER-B high activity period.

M-Wave Spect agreed to delete support in Week 06, and to reduce support to 4 hours using DSS-43 in Weeks 07 through 09 to reduce contention during the MER-A and MER-B high activity period.

Planet R/AST agreed to delete support in Week 06 and 09 and reduce support to 4 hours in Week 07 and 08 to reduce contention during the MER-A and MER-B high activity period.

Goldstone Solar System Radar Asteroid Minos agreed to move one 5-hour support to Week 05 to reduce contention at DSS-14 for DSS Maintenance and Mars Odyssey.

Mars Odyssey did not accept the recommendation to reduce seven 8-hour stand-alone Mapping passes to two 4-hour supports in Week 06 and 09 to reduce five 4-hour supports in Week 07 and 08. Mars Odyssey/MER-A did not accept the recommendation to reduce its seven 8-hour MSPA supports to three 8-hour and four 4-hour supports in Week 06 and 09. MER-A/Mars Odyssey did not accept the recommendation to reduce its seven 8-hour MSPA supports to three 8-hour and four 4-hour supports in Week 06 and 09. The Mars Program Office, Charles Whetsel accepted an action to investigate contention and provide resolution under *AI #7*.

Ulysses agreed to reduce support to fourteen 8-hour passes per week, but stressed maintaining continuous coverage on a best effort basis.

Note: Jupiter Closest approach is in Week 06, February 5 (DOY 036) and the radial and meridional alignment is in Week 09, February 27 (DOY 057). The Ulysses operations plan is to turn the spacecraft recorder off in Week 04, January 22 (DOY 022) and turn it back on in Week 11, March 11 (DOY 70). Ulysses, Bruce Brymer stated, "We need to secure the recorder in order to have the power to supply all the scientific instruments aboard the spacecraft for these historic events. Any significant lesser support would be futile. Without the continuous downlink support the recorder must stay on, therefore some instruments would have to stay off".

WIND agreed to move all support to DSS-34 to accommodate Ulysses, GNS, and Mars Express on the 34B1 subnet.

Voyager 2 agreed to reduce support to seven 8-hours at DSS-34 and DSS-45 to 6 hours to accommodate Ulysses, WIND, GNS, and SDU.

2004 Contention Period - March - Weeks 10 - 13

GSSR agreed to reduce Week 11 Mercury request to 3 hours in duration.

Mars Odyssey agreed to reduce 4 stand-alone passes to 4 hours in Weeks 11 - 13.

Polar agreed to move support in Week 11 from 34BWG1 to 26m.

SOHO agreed to move TSO support to Week 10 and to delete all support requested on the 34B1 in Week 11 and to restore nominal support request for Week 11 on the 26m.

2004 Contention Period - April - Weeks 14 - 18

GSSR agreed to delete Mercury observations requested in Weeks 15, 16, and 18.

Ground Based Radio Astronomy agreed to reduce 70m Host Country support to 8-hours in Week 15 and 16, and to reduce DSS-45 support to 8 hours in Week 17.

Mars Odyssey agreed to reduce 4 stand-alone passes to 4 hours.

Mars Global Surveyor agreed to move 3 passes per week from the 34H to the 34B1.

SGP did not agree to the recommendation of reducing DSS-45 Crustal Dynamics support in Week 15 from 24 hours to 8 hours, but did agree to reduce support to 12 hours.

2004 Contention Period - May - Weeks 19 - 22

DSS Maintenance agreed to reduce one DSS-14 8-hour routine maintenance to 6 hours and reduce one DSS-63 10-hour routine maintenance to 8 hours in weeks 21 and 22 to accommodate Mars Odyssey, MER-A, and MER-B MSPA supports.

DSN Antenna Cals agreed to delete support in Week 21 and 22 to accommodate Mars Odyssey, MER-A, MER-B MSPA supports, DSS Maintenance, and GSSR.

EVN E500 J-M4 agreed to split support into two 8-hour increments to accommodate Mars Odyssey, MER-A, MER-B MSPA supports, DSS Maintenance, and GSSR.

Ground Base Radio Astronomy agreed to move RA500 SOC-M4 support to Week 23 and split support into three 8-hour increments to accommodate Mars Odyssey, MER-A and MER-B MSPA supports, DSS Maintenance, and GSSR. Ground Base Radio Astronomy agreed to delete M-Wave Spect and Planet R/AST in Week 21 and 22 to accommodate Mars Odyssey, MER-A and MER-B MSPA supports, DSS Maintenance, and GSSR.

Gravity Probe B agreed to reduce DSS-14 support to 8 hours in week 21 to accommodate Mars Odyssey, MER-A, MER-B MSPA supports, DSS Maintenance, and GSSR.

Goldstone Solar System Radar agreed to reduce the Mercury observation support in Week 21 from 5.9 hours to 3 hours to accommodate Mars Odyssey, MER-A, MER-B MSPA supports, DSS Maintenance, and GPB.

Mars Odyssey did not accept the recommendation to reduce 3 supports to 4 hours to accommodate DSS Bearing and Routine Maintenance. Mars Odyssey agreed to MSPA with Mars Express and Mars Global Surveyor at DSS-63.

Mars Express agreed to schedule Bi-static R/S support at DSS-63 only.

Mars Global Surveyor agreed to requested support using DSS-15, DSS-45, 34BWG1, and 34BWG2 while accommodating DSS Maintenance.

Nozomi agreed to schedule two supports at DSS-63 and one support at DSS-14 to accommodate Mars Odyssey, MER-A and MER-B MSPA supports, DSS Maintenance, GPB, and GSSR.

Polar agreed to requested support using 26m and DSS-34.

SOHO HSO agreed to requested support using 26m, 34HSB, and 34B1.

SGP Crustal Dynamic did not accept the recommendation to delete support, but did agree to move SGP support to August of 2004.

WIND agreed to requested support using DSS-24, 34.

2004 Contention Period - June - Weeks 23 - 26

Cassini agreed to use maximum view at DSS-25, and to reduce DSS-45 from 8-hour supports to 4 hours for TCM Day support. In addition, Cassini agreed to use 8-hour supports at DSS-54, 55 to accommodate DEEP Impact.

Deep Impact agreed to use DSS-15, 45, 34 to accommodate Cassini.

DSS Maintenance agreed to reduce DSS-24 support from 8 hours to 6 hours in Week 25 and 26 to reduce contention on the 34M subnets and to accommodate Cassini, Deep Impact, MER-B Surface U/L, Mars Global Surveyor Mapping and GBRA activity. DSS Maintenance agreed to reduce DSS-45 from 6 hours to 5 hours and to reduce DSS-14 routine maintenance from one 8-hour to one 6-hour support in Week 23 and 26. This recommendation is to reduce contention on the 34M subnets and to accommodate Cassini, Deep Impact, MER-B Surface U/L, Mars Global Surveyor Mapping and GBRA activity.

Ground Base Radio Astronomy Host Country agreed to change its 12-hour support to two 8-hour supports to reduce contention on the 34M subnets and accommodate Cassini, Deep Impact, MER-B Surface U/L, and Mars Global Surveyor Mapping.

Mars Odyssey Mapping agreed to reduce three supports from 8 hours to 4 hours in Weeks 23 and 26, to reduce four supports from 8 hours to 4 hours in Week 24, and to reduce five supports from 8 hours to 4 hours in Week 25 to accommodate DSS Maintenance.

Mars Express agreed to use DSS-14 in Week 23 and to use DSS-63 in Week 24 and Week 26 for Bi-static R/S support. Mars Express agreed to use planed Occultation and Orbital Science supports (sum of 16 hours) at DSS-24 and 54 in Weeks 25 and 26

Nozomi agreed to plan two supports at DSS-14 and one at DSS-63 in Week 23 and plan two supports at DSS-63 and one at DSS-14 in Week 24 and 26 and to accommodate Mars Odyssey, Mars Express, and DSS Maintenance.

Polar agreed to requested support using DSS-27, 46, and 34B1.

SOHO HSO agreed to requested support using the 26m subnet, DSS-27 and 24.

Voyager 2 agreed to use 5 split passes at DSS-45 and 34 and seven 8-hour passes at DSS-43, 45, 34.

2004 Contention Period - July - Weeks 27 - 31

CONTOUR agreed to use split passes of 4 hours each at DSS-43, 63 (viewperiod at DSS-63 is approximately 4 hours) for requested support.

DSN Antenna Calibration agreed to reduce support to 4 hours in Weeks 27 - 29.

DSS Maintenance agreed to delete DSS-14 Bearing and two Routine Maintenance in week 27, (DSS-14 is scheduled for downtime starting in week 27 and continuing through week 31) and to delete DSS-63 6-hour Routine Maintenance in week 27.

Mars Odyssey agreed to reduce three passes to 4 hours in Week 27 and reduce support from eleven 7-hour to seven 8-hour and two 5-hour supports in Week 29. Mars Odyssey will offset this reduction by increasing from eleven 7-hour supports to ten 8-hour and one 5-hour supports in Weeks 28, 30, and 31.

Mars Express agreed to requested support using DSS-24 and 54 for Occultation support in Week 27 and 28.

Polar agreed to requested support using the 26m subnet and DSS-27.

SOHO HSO agreed to requested support using the 26m subnet and DSS-27.

Voyager 1 agreed to requested support using DSS-25, 65, and 55.

Voyager 2 agreed to requested support using DSS-45 and 43.

2004 Contention Period - August - Weeks 32 - 35

The contention level is workable and should resolve during final schedule preparations and negotiations.

2004 Contention Period - September - Weeks 36 - 40

The contention level is workable and should resolve during final schedule preparations and negotiations.

2004 Contention Period - October - Weeks 41 - 44

The contention level is workable and should resolve during final schedule preparations and negotiations.

2004 Contention Period - November - Weeks 45 - 48

The contention level is workable and should resolve during final schedule preparations and negotiations.

2004 Contention Period - December - Weeks 49 - 53

The contention level is workable and should resolve during final schedule preparations and negotiations.

2005 Contention Period - January - Weeks 01 - 04

Mars 01 Odyssey agreed to move DSS-54 support to DSS-55 in Weeks 01-03 to resolve extreme contention caused by Mars Express Occultation and Orbital Science and Mars 01 Odyssey supports in Weeks 01-03.

2005 Contention Period - February - Weeks 05 - 08

The contention level is workable and should resolve during final schedule preparations and negotiations.

2005 Contention Period - March - Weeks 09 - 13

Mars Express agreed to move DSS-54 support to DSS-55 in weeks 10-13 to resolve moderate contention in weeks 10-13 caused by Mars Express Orbital Science, Deep Impact Cruise support at DSS-24, 54 and Mars 01 Odyssey support at DSS-15, 34 and 54.

2005 Contention Period - April - Weeks 14 - 17

SGP agreed to move support from Week 17 to Week 14 to resolve moderate contention in week 17 at DSS-15 caused by Deep Impact Trajectory Correction Maneuver, Voyager 1 DTR Array and maintenance compounded by DSN M&E and SGP 24-hour support.

2005 Contention Period - May - Weeks 18 - 21

The contention level is workable and should resolve during final schedule preparations and negotiations.

2005 Contention Period - June - Weeks 22 - 26

DSS agreed to reduce DSS-27 routine maintenance from 8-hours to 6-hours in week 26 to resolve severe contention at DSS-27 between Maintenance and SOHO HSO support in week 26.

2005 Contention Period - July - Weeks 27 - 30

DSS agreed to reduce DSS-27 routine maintenance from 8-hours to 6-hours to resolve severe contention at DSS-27 between Maintenance and SOHO HSO continuous support.

2005 Contention Period - August - Weeks 31 - 34

DSS agreed to reduce DSS-15 and DSS-27 maintenance from 8 hours to 6 hours to accommodate moderate contention in Weeks 32-34 on the 34H caused by Voyager 1, Cassini, Mars Reconnaissance Orbiter Launch and TCM and Routine Maintenance.

GSSR Asteroid 19922UY4 agreed to plan supports to accommodate VOYAGER 1 MAGROL on DOY 218.

2005 Contention Period - September - Weeks 35 - 39

DSS agreed to reduce DSS-27 routine maintenance from 8-hours to 6-hours in Weeks 35 to 38 to resolve severe contention at DSS-27 between Maintenance and SOHO HSO continuous support in Weeks 35-38.

2005 Contention Period - October - Week 40 - 43

The contention level is workable and should resolve during final schedule preparations and negotiations.

2005 Contention Period - November - Weeks 44 - 47

Mars Express agreed to use DSS-24 and DSS-63 in Weeks 46 and 47 to resolve a moderate contention caused by Mars Odyssey, Mars Express Orbital Science, and Stereo Ahead and Stereo Behind Launch support at DSS-54.

Mars 01 Odyssey agreed to move support to the 70m in week 46 and 47 to resolve a moderate contention in week 46 caused by Stardust TCM, and Stereo Ahead and Stereo Behind support on the 34B2.

Stardust agreed to move 2 TCM passes to DSS-15, and DSS-65 in Week 46 to resolve a moderate contention caused by Mars Odyssey, Stereo Ahead and Stereo Behind Launch support on the 34B2.

Voyager 1 agreed to move two passes to DSS-15 and DSS-65 in Week 46 to resolve moderate contention at DSS-26 and DSS-55 caused by routine maintenance.

Voyager 2 agreed to reduce routine support to seven 8-hour passes and to use DSS-43 in Week 46 to resolve moderate contention caused by DSS maintenance, Mars Reconnaissance Orbiter, and Stereo Behind Launch support at DSS-45.

2005 Contention Period - December - Weeks 48 - 52

Mars 01 Odyssey agreed to move support from DSS-54 to DSS-55 in Weeks 48 to 51 to resolve severe contention caused by Mars Express Occultation, and Orbital Science, Mars 01 Odyssey, and Stereo Behind Maneuver on the 34BWG1.

Mars 01 Odyssey agreed to move support from DSS-34 to DSS-45 in Week 49 and 52 to resolve severe contention caused by Stereo Ahead, Mars Reconnaissance Orbiter TCM, Mars 01 Odyssey, and Stereo Behind Maneuver at DSS-34.

Stereo Ahead agreed to move Maneuver support from DSS-25 to DSS-15 in Week 48 and 52.

Stereo Behind agreed to move Maneuver support from DSS-45 to DSS-43 in Week 49.

Action Item Summary from February 12, 2002 RARB follows...

Action Item Summary from Feb 12, 2002 RARB - D. Morris

#	Year	Month	System	Responsible	Due	Status	Action
1	2004	January	MER	J. Erickson	6/1/2002	Open	Provide Final Landing Site coordinates (SPK file) for both Rovers one year prior to launch. (Reference A.I. #7 of August 13, 2001 RARB)
2	2003	January - December	DSMS Plans & Commit.	R. Miller	4/22/2002	Open	Investigate and Negotiate the feasibility of alternate assets providing current DSN Catalog Maintenance and Enhancement (CAT M&E) radio sources.
3	2003	January - December	SGP	N. Lacey/ P. Wolken	4/1/2002	Closed 4/16/02	As a result of recommending deletion of the entire 2003 request of Space Geodesy Program, provide a listing of opportunities to the project to assist in their re-planning a reduced (hours) experiment.
4	2003	January	SIRTF	P. Beyer	4/18/2002	Closed 4/4/02	Perform telecom analysis to determine the adequacy of DSS-63 supporting spacecraft on day of launch. The expressed concern is that the DSS-63 X-band transmitter may saturate the SIRTF receiver. (DSS-65 has Downtime; DSS-54 is supporting Cassini GWE.)
5	2003	January - April	DSN	M. Wert	4/19/2002	Closed 4/10/02	Investigate the impact to operations from deleting or reducing the 70m Antenna Calibrations in this period.
6	2003	November	MER-A Odyssey	J. Erickson	4/18/2002	Open	MER-A agreed to modify DSN requests for Odyssey and MGS to fulfill required support in weeks 46-47 of November 2003.
7	2003-2004	December-February	Mars Program	C. Whetsel	5/1/2002	Open	Mars Program will evaluate support problems during the mid-December 2003 through end of February 2004 timeframe. All NASA and non-NASA Mars missions requirements will be evaluated and coordinated in light of the NASA Mars mission priorities and provided in time to be addressed at the August 2002 RARB.
8	2004	January	Cassini	B. Mitchell	4/18/2002	Open	Cassini, based upon the recommendations of taking daily 1-4 hour gaps during the Canberra/Madrid overlap in January 2004, will evaluate impact to GWE. In addition, evaluate sliding the entire 40 days for the GWE earlier by a few weeks.
9	2004	January	MER-B	J. Erickson	4/18/2002	Open	Mars Exploration Rover Project will evaluate whether MER-B can reduce coverage during critical MER-A TCMs (4, 5 and 6) in order that the support is used for a MER-A required hot-backup 34m antenna.
10	2004	January	DSN	C. Jacobs	4/18/2002	Open	Provide analysis of impact (e.g., to MER-B landing accuracy) of moving DSN Clock Sync VLBI out to week 4.
11	2004	January	MER	J. Ludwinski	2/26/2002	Closed 3/8/02	Provide MER Project Surface Operations Viewperiods for the four primary and two alternate landing sites to RAPSO (J. Kehrbaum).
12	2003-2004	November -February	DSMS Plans & Commit.	R. Miller	5/1/2002	Open	Identify Risk Posture for individual mission's key events to plan steps the DSN can do to mitigate foreseeable anomalies (e.g., station outages, s/c emergency, MCD3 contention, etc.).

ACE

Afkhami, F. GSFC m/s 428.2
 Sodano, R. J. GSFC m/s 581.0

2007 ASI/NASA G. Marconi Orbiter

Komarek, T. A. 301-370

Canberra Deep Space Communications Complex

Churchill, P. CDSCC
 Jacobsen, R. CDSCC
 O'Brien, J. J. CDSCC
 Ricardo, L. CDSCC
 Robinson, A. CDSCC
 Wiley, B. CDSCC

Cassini

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 Gustavson, R. P. 230-301
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 Sakamoto, L. L. 230-104
 Webster, J. L. 230-104

Chandra

Digesu, S. MSFC Org. FD32
 Gage, K. R. SAO
 Lavoie, A. R. (PM) MSFC Org. FD03
 Marsh, K. SAO
 O'Dell, S. L. MSFC Org. SD50
 Weisskopf, M. C. (PS) MSFC Org. SD50
 Wicker, D. SAO
 Williams, B. SAO
 Wright, G. M. MSFC Org. FD03

Comet Nucleus Tour (CONTOUR)

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2007 CNES Premier Orbiter + Netlanders

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Deep Impact

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Europa

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Altunin, V. I. 303-402

Explorers Program Office

Barrowman, J. S. (PM) GSFC m/s 410.0

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GOES

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 Bors, J. Boeing
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 LeBair, W. J. GSFC m/s 415.0
 Settles, M. NOAA
 Skidmore, R. W. Omitron

Goldstone Complex

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Haldemann, A. F. 238-420
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Gravity Probe B

Arroyo, B. 264-235
 Keiser, M. (PS) Stanford Univ.
 Shapiro, Prof. I. I. Smithsonian Astrophysical Obsrv

Host Country Radio Astronomy

Klein, M. J. (PM)	303-402
Volken, P. R.	507-105

IMAGE

Abramo, C. A.	507-120
Burch, J.	SwRI
Burley, R. J.	GSFC m/s 632.0
Gibson, W. C.	SwRI
Green, J. L.	GSFC m/s 630
Tapley, M. B.	SwRI

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Clausen, K. (PM)	ESA/ESTEC
Comberiate, A. B. (PM).	GSFC m/s 410.0
Maldari, P.	ESA/ESOC

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Rodrigues, M. J.	303-400
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Stelzried, C. T.	303-407
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Kwok, A.	303-402
Luers, E. B.	303-402
Martin, W. L.	303-402
McLaughlin, F. D.	303-402
Miller, R. B.	303-402
Moyd, K.	303-402
Poon, P. T.	303-402
Slusser, R. A.	303-402
Tai, W. S.	303-402
Waldherr, S.	303-402
Yetter, B. G.	303-402

IPN-ISD / DSMS RAPSO

Bartoo, R. H.	303-403
Borden, C. S.	301-165
Burke, E. S.	303-403
Caputo, R.	514-200
Hampton, E.	600-174
Hincy, W.	600-174
Hungerford, R. M.	301-285
Kehrbaum, J. M.	301-180
Kim, K.	600-174
Lacey, N.	600-174
Lineaweaver, S.	600-174
Martinez, K. A.	600-174
Morris, D. G.	303-403
Valencia, J.	600-174
Wang, Y-F.	301-165
Zendejas, S. C.	301-165

ISTP (Cluster II)

Abramo, C. A.	507-120
Christensen, J. L.	GSFC m/s 404.0
Dutilly, R. N.	GSFC m/s 581.1
Gurnett, D.	U. of Iowa
Martin, W. L.	303-402
Pickett, J.	U of Iowa
Warhaut, M.	ESA/ESOC

ISTP (GEOTAIL/POLAR/SOHO/WIND)

Abramo, C. A.	507-120
Acuna, M. H. (PS)	GSFC m/s 695.0
Alexander, H.	502-320
Bush, R. I.	Stanford Univ.
Carder, M. E.	GSFC 450.C
Desch, M. D.	GSFC m/s 695.0
Dutilly, R. N.	GSFC m/s 581.1
Fairfield, D. H. (PS)	GSFC m/s 695.0
Giles, B. L.	GSFC m/s 692.0
Gurman, J. B.	GSFC m/s 682.3
Hearn, S. P.	GSFC m/s 450.C
Hesse, M. (PS)	GSFC m/s 696.0
Hoffman, R. A. (PS)	GSFC m/s 696.0
Kelly, T. M.	GSFC m/s 428.2
Leventry, G. A.	GSFC m/c 428.2
Machado, M. J.	GSFC m/s 428.2
Mahmot, R. E.(PM)	GSFC m/s 444.0
Milasuk-Ross, J.	GSFC m/s 428.5
Miller, K. A.	GSFC m/s 450.C
Nace, E. M.	GSFC m/s 450.8
Odendahl, S. K.	GSFC m/s 581.0
Ogilvie, K. W. (PS)	GSFC m/s 690.0

JPL / Director's Office

Elachi, C.	180-904
Tattini, E.	180-904

JPL / General

Acton, C. H.	301-125L
Beswick, C. A.	126-110
Chien, S. A.	126-347
Frederick, S. Y.	180-202
Jones, C. P.	264-472
Kahr, B. E.	301-385
Manshadi, F.	238-725
McClure, J.R.	264-214
Randolph, J. E.	301-170U
Simmons, L. L.	180-704
Thurman, S. W.	264-440
Toyoshima, B.	301-276
Vu, Q. A.	171-264
Woo, H. W.	126-110
Yuen, J. H.	238-540

Lunar-A

Arroyo, B.	264-235
Mizutani, H.	ISAS
Nakajima, T.	ISAS
Ryne, M. S.	301-276

Madrid Deep Space Communications Complex

Martin, A.	MDSCC
Chamarro, A.	MDSCC
Gimeno, J.	MDSCC
Gonzalez, C.	MDSCC
Rosich, A.	MDSCC

MAP

Abramo, C. A.	507-120
Bennett, C. L. (PS)	GSFC m/s 685.0
Coyle, S. E.	GSFC m/s 581.0
Dew, H. C.	GSFC m/s 423.0
Mahmot, R. E.(PM)	GSFC m/s 444.0
Powers, M. K.	GSFC m/s 567

Mars Exploration Rover (MER A & B)

Adler, M.	T1723
Arroyo, B.	264-235
Crisp, J. A. (PS)	T1722
Erickson, J. K.	T1723
Ludwinski, J. M.	T1722
Roncoli, R. B.	301-125
Theisinger, P. C. (PM)	T1722

Mars Express Orbiter (MEX)

Arroyo, B.	264-235
Butman, S. A.	264-255
Campbell, J. K.	264-426
Horttor, R. L. (PM)	238-540
McKay, M.	ESA/ESOC
Morrison, A. D.	264-426
Schmidt, R. (PM)	ESA/ESTEC
Thompson, T. W.	300-227

Mars Global Surveyor (MGS)

Albee, A. (PS)	264-282
Arroyo, B.	264-235
Brower, E. E.	264-235
Thorpe, T. E. (PM)	264-214
Yetter, K. E.	264-235

Mars 2001 Odyssey Mission (M01O)

Arroyo, B.	264-235
Gibbs, R. G.	264-283
Harris, J. A.	301-455
Landano, M. R. (PM)	264-725
Mase, R. A.	264-380
Saunders, R. S. (PS)	180-701
Spencer, D. A.	264-255

Mars Program Office

Cutts, J. A.	264-426
Edwards, C.	264-438
Jordan, Jr., J. F.	264-472
McCleese, D. J.	264-426
Naderi, F. M.	264-438
Whetsel, C.W.	264-426

Mars Reconnaissance Orbiter Project

Arroyo, B.	264-235
Graf, J. E. (PM)	301-420
Johnston, M. D.	301-420
Lock, R. E.	301-420
Zurek, R. (PS)	301-420

MESSENGER

Arroyo, B. 264-235
 Farquhar, R. (MM) APL 2-155
 Huebschman, R. (DPM) APL 4-248
 Peterson, M. (PM) APL 4-244

MUSES-C

Arroyo, B. 264-235
 Kawaguchi, J. ISAS
 Peters, S. ISAS
 Ryne, M. S. 301-276
 Smith, J. G. (PM) 264-828

NASA Headquarters

Albright, G. G. Code SD
 Bergstralh, J. T. Code SE
 Bogan, D. Code SE
 Boyce, J. M. Code SE
 Brody, S. Code SD
 Costrell, J. A. Code MT
 Dahl, M. R. Code SD
 Geldzahler, B. Code SE
 Hertz, P. Code SE
 Holmes, C. P. Code SE
 Jones, W. V. Code SE
 LaPiana, L. S. Code SD
 Lavery, D. B. Code SM
 Meyer, M. A. Code SE
 Morgan, T. H. Code SE
 Ocampo, A. C. Code SD
 Riegler, G. R. Code S
 Spearing, R. E. Code M-3
 Thronson, H. Code S
 Wagner, W. J. Code SE
 Watkins, M. A. Code SD
 Williams, R. L. 180-300
 Withbroe, G. L. Code S

NASA/GSFC/General

Achey, R. A. GSFC m/s 450.A
 Ambardekar, S. P. GSFC m/s 450.A
 Barbehenn, G. M. GSFC m/s 440.8
 Barbehenn, M. B. GSFC m/s 450.S
 Bibyk, I. GSFC m/s 581.0
 Buczkowski, V. R. GSFC m/s 424.0
 Carlisle, C. GSFC m/s 532.0
 Currier, S. F. Wallops m/s 452.W
 Davenport, D. G. GSFC m/s 453.7
 Davis, A. D. GSFC m/s 450.A
 Harris, R. N. GSFC m/s 452.0
 Hunter, R. A. GSFC m/s 450.A
 Levine, A. J. GSFC m/s 452.0
 Marinaccio, C. A. GSFC m/s 450.C
 Martin, J. B. GSFC m/s 451.0
 Mateik, D. E. GSFC m/s 450.A
 Mathis, E. S. GSFC m/s 450.1

Purdy, C. L. Wallops m/s 800.0
 Quint, K. B. GSFC m/s 450.A
 Schaub, M. B. GSFC m/s 450.A
 Williams, A. K. GSFC m/s 450.A

NASA/JSC/General

Bull, Jr., G. W. JSC Code DB

NASA/SOMO

Dalton, J. T. GSFC 720.0
 Davidson, W. L. JSC Code TR
 Downen, A. Z. 303-400
 Hall, V. F. JSC Code TG
 Hervey, J. I. JSC Code TA
 Morse, G. A. JSC Code TA
 Thoman, B. E. GSFC 581.0
 Thompson, E. W. JSC Code GA

2007 NASA Scout Mission

Matousek, S. 264-472

NOZOMI (Planet B)

Arroyo, B. 264-235
 Hayakawa, H. ISAS
 Nakatani, I. ISAS
 Niemann, H. B. GSFC m/s 915.0
 Ryne, M. 301-276
 Tay, P. 264-235
 Tsuruda, K. ISAS
 Yetter, K. E. 264-235

PFPD / Mission Management Office

Morris, R. B. 264-235
 Varghese, P. 264-235

Radio Astronomy

Klein, M. J. (PM) 303-402
 Kuiper, T. B. (PS) 169-506
 Martinez, G. 507-120
 VanAllen, J. A. U. of Iowa
 Wolken, P. R. 507-105

Reference Frame Calibration

Altunin, V. I. 303-402
 Cangahuala, A. (PM) 301-125J
 Jacobs, C. 238-600

Rosetta (ROSE)

Alexander, C. J. (PS) 169-237
 Arroyo, B. 264-235
 Ellwood, J. (PM) ESA/ESTEC
 Klein, G. A. 233-202
 Schwehm, G. H. (PS) ESA/ESTEC
 Warhaut, M. ESA/ESOC
 Wellman, J. B. 233-200

Space Geodesy (NASA Goddard)

Ma, C. GSFC m/s 926
 Vandenberg, N. R. GSFC m/s 920.1

Space Infrared Telescope Facility (SIRTF)

Arroyo, B. 264-235
 Gallagher, D. B. (PM) 264-767
 Kwok, J. H. 264-767
 Wilson, R. K. 264-767

StarLight Mission

Arroyo, B. 264-235
 Carrion, C. 301-250D
 Livesay, L. L. (PM) 301-451
 Spradlin, G. L. 301-451

Stardust

Arroyo, B. 264-235
 Duxbury, T. C. (PM) 264-379
 Hirst, E. 264-570
 Ryan, R. E. 301-285
 Tay, P. 264-235
 Yetter, K. E. 264-235

STEREO

Driesman, A. S. APL MD1-118
 Eichstedt, J. APL 36-107
 Mueller, J. T. (PM) APL 4-282
 Ossing, D. A. APL 36-107

TDRS - I and J

Ambrose, L. L. GSFC 451.0
 Gagosian, J. GSFC 571.0

Ulysses / Voyager

Angold, N. G. 264-114
 Arroyo, B. 264-235
 Beech, P. 264-801
 Brymer, B. F. 264-114
 Cummings, A. C. CIT 220-47
 Hall, Jr., J. C. 264-801
 Massey, E. B. (PM) 264-801
 Medina-Gussie, M. 301-225
 Nash, J. C. 264-114
 Smith, E. J. (PS-ULYS) 169-506
 Stone, E. C. (PS-VGR) CIT 220-47
 Yetter, K. E. 264-235

U.S. Space VLBI

Altunin, V. I. 303-402
 Miller, K. J. 264-828
 Preston, R. A. (PS) 238-332
 Smith, J. G. (PM) 264-828

YOHKOH

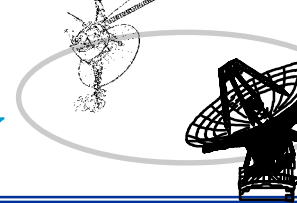
Chang, A. F. 264-844

Other Organizations

Hall, L. LMSOC
 Ninomiya, K. ISAS
 Sawai, S. ISAS
 Yamada, T. ISAS
 Yamakawa, H. ISAS
 Yoshikawa, M. ISAS

**Please mark any additions, deletions, or corrections to
 this distribution list and return to:**

David G. Morris
 Jet Propulsion Laboratory
 4800 Oak Grove Drive, 303-403
 Pasadena, CA 91109 / 818-393-3535
 email: David.G.Morris@jpl.nasa.gov



RESOURCE ALLOCATION REVIEW

Agenda

- | | | |
|---|---------------|-------|
| • INTRODUCTION | B. Weber | 8:30 |
| • OVERVIEW, ACTION ITEMS, CONTENTION SUMMARY | G. Burke | 9:45 |
| • NASA HQ PERSPECTIVE | | |
| – CODE S | B. Geldzahler | 9:00 |
| • JPL DSMS PLANS & COMMITMENTS PROGRAM OFFICE | R. Miller | 9:20 |
| • JPL DSMS ENGINEERING PROGRAM OFFICE | J. Statman | 9:40 |
| • JPL DSMS OPERATIONS PROGRAM OFFICE | A. Berman | 10:00 |
| • NEW OR MODIFIED PROJECT REQUIREMENTS | | |
| – New Horizons | R. Farquhar | 10:20 |
| – ST-5 | I. Bibyk | 10:40 |
| • RESOURCE CONTENTIONS | | |
| – Analysis & Recommendations | N. Lacey | 11:00 |
| – Responses | Projects | |
| – Discussion / Decisions | All | |
| • NEW ACTION ITEMS & SUMMARY | G. Burke | |

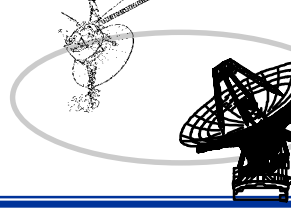


RESOURCE ALLOCATION REVIEW

Review Board Members

Bill Weber	JPL	Chairman
Gene Burke	JPL	Resource Allocation Planning & Scheduling Office Mgr
Arden Albee	Caltech	Mars Global Surveyor Project Scientist
Donald Burnett	Caltech	Genesis Project Scientist
Al Cangahuala	JPL	Reference Frame Calibration Project Manager
Joy Crisp	JPL	Mars Exploration Rover Project Scientist
Alan Cummings	Caltech	Voyager Project Scientist Representative
Peter Doms	JPL	Deep Space Mission System (DSMS) Manager
Tom Duxbury	JPL	Stardust Project Manager
John Eichstedt	SPL	STEREO Project Representative
Bob Farquhar	APL	MESSENGER Mission Manager, CONTOUR
John Gagosian	GSFC	TDRS I, J Project Manager Representative
David Gallagher	JPL	SIRTF Project Manager
Roger Gibbs	JPL	Mars 2001 Odyssey Deputy Project Manager
Ike Gillam	HTSI	CSOC JPL Site Manager
Dick Goldstein	JPL	Goldstone Orbital Debris Radar

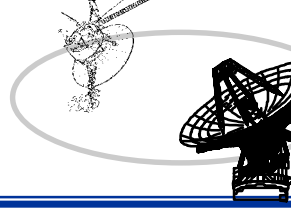
RESOURCE ALLOCATION REVIEW



Review Board Members

Jim Graf	JPL	Mars Reconnaissance Orbiter Project Manager
Dwight Holmes	JPL	INTEGRAL, Rosetta Representative
Richard Horttor	JPL	Mars Express Orbiter Project Manager
Torrence Johnson	JPL	Galileo Project Scientist
Mike Klein	JPL	Radio Astronomy Project Manager
Ron Mahmot	GSFC	Space Science Mission Operations Project Manager (ISTP, ACE, Image, MAP)
Ed Massey	JPL	Ulysses/Voyager Project Manager
Dennis Matson	JPL	Cassini Program Scientist
Rich Miller	JPL	DSMS Plans & Commitments Office Manager
Bob Mitchell	JPL	Cassini Project Manager
Brian Muirhead	JPL	Deep Impact Project Manager
Steve Ostro	JPL	GSSR Project Scientist
Bob Preston	JPL	U.S. Space VLBI Project Scientist

RESOURCE ALLOCATION REVIEW

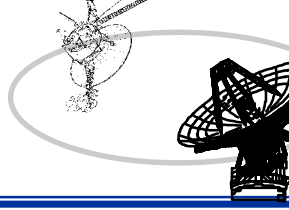


Review Board Members

Chet Sasaki	JPL	Genesis Project Manager
Steve Saunders	JPL	Mars 2001 Odyssey Mission Project Scientist
Rance Skidmore	Omitron	GOES Project Manager Representative
Martin Slade	JPL	GSSR Project Manager
Ed Smith	JPL	Ulysses Project Scientist
Joel Smith	JPL	Muses-C, U.S. Space VLBI Project Manager
Joe Statman	JPL	DSMS Engineering Program Office Manager
Eileen Theilig	JPL	Galileo Project Manager
Pete Theisinger	JPL	Mars Exploration Rover (MER) Project Manager
Tom Thorpe	JPL	Mars Global Surveyor Project Manager
Phil Varghese	JPL	Planetary Flight Projects Mission Management Office
Joe Wackley	JPL	DSMS Operations Office Program Manager
Greg Wright	MSFC	Chandra Project Manager Representative



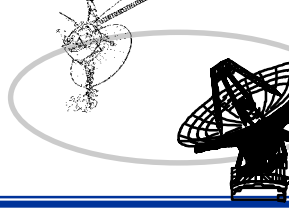
RESOURCE ALLOCATION REVIEW



Introduction



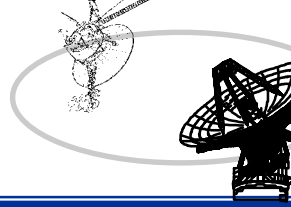
Bill Weber



Introduction

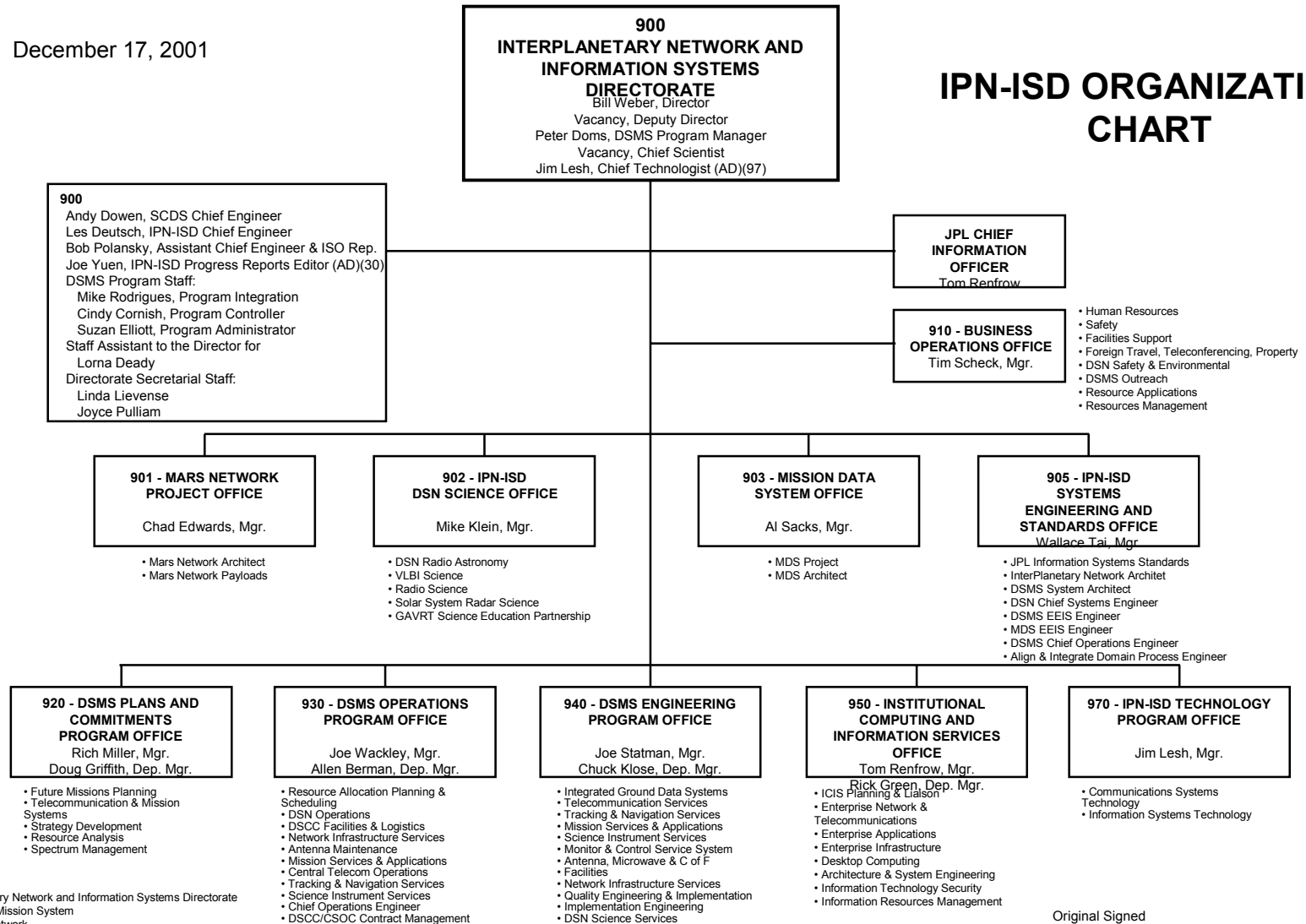
- **Welcome To The Resource Allocation Review**
 - **Board Was Established to Provide Control of Tracking Requests 26, 34, & 70-Meter Subnets**
 - **Recommend Resource Allocation and Assist in Capacity Planning**
- **Requirements 2003 Through 2012**
- **Conflicts in 2003 Through 2005 Needing Resolution**

RESOURCE ALLOCATION REVIEW



Effective: December 17, 2001

IPN-ISD ORGANIZATION CHART

**Legend:**

IPN-ISD = InterPlanetary Network and Information Systems Directorate

DSMS = Deep Space Mission System

DSN = Deep Space Network

DSCC = Deep Space Communication Complex

CSOC = Consolidated Space Operations Contract

GAVRT = Goldstone-Apple Valley Radio Telescope

SCDS = Space Communications and Data Systems

EEIS = End-to-End Information System

AD = Additional Duty

01-265B

December 17, 2001

Original Signed

William J. Weber, Director for
InterPlanetary Network and Information
Systems

A large, faint background graphic featuring a satellite dish antenna. A thick, grey circular arrow encircles the dish, pointing clockwise. The text 'Overview', 'Action Items', and 'Contention Summary' is overlaid on this graphic in a large, blue, sans-serif font.

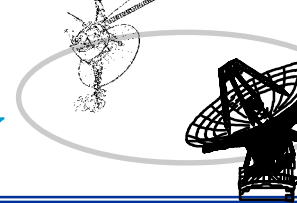
Overview

Action Items

Contention Summary



Gene Burke

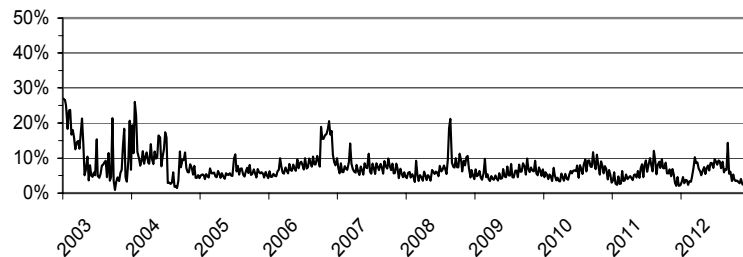


RESOURCE ALLOCATION REVIEW

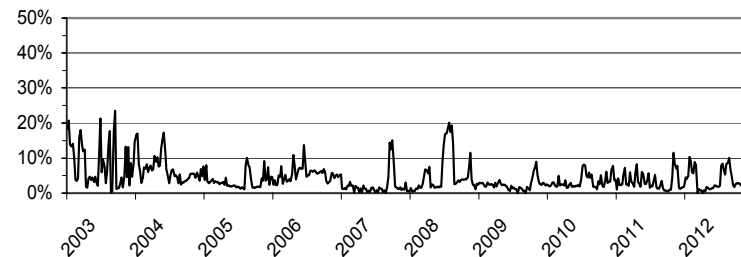
Projected Unsupportable Time Summary

% of Requested Time Unsupportable

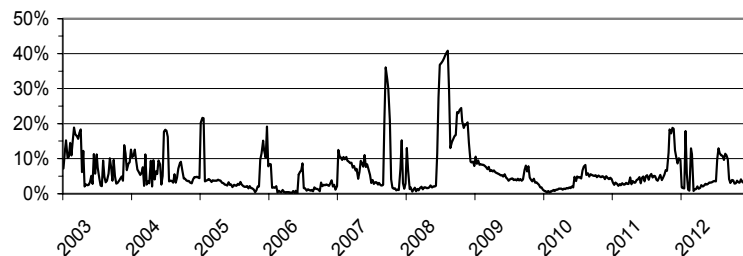
70M



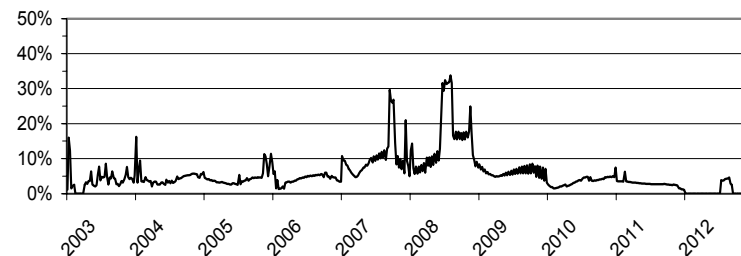
34HEF



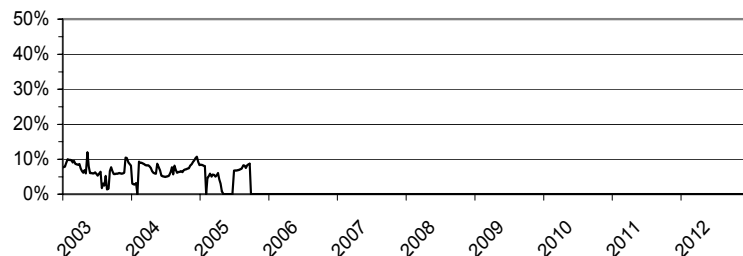
34BWG1



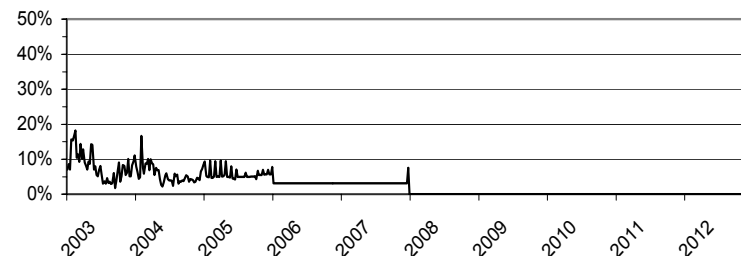
34BWG2



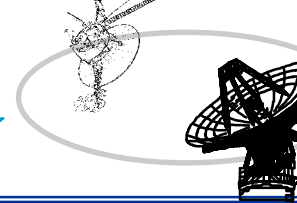
34HSB



26M

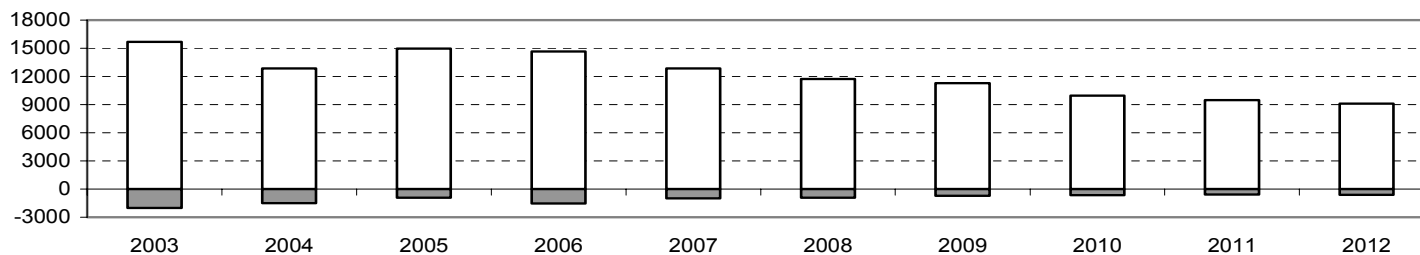


RESOURCE ALLOCATION REVIEW

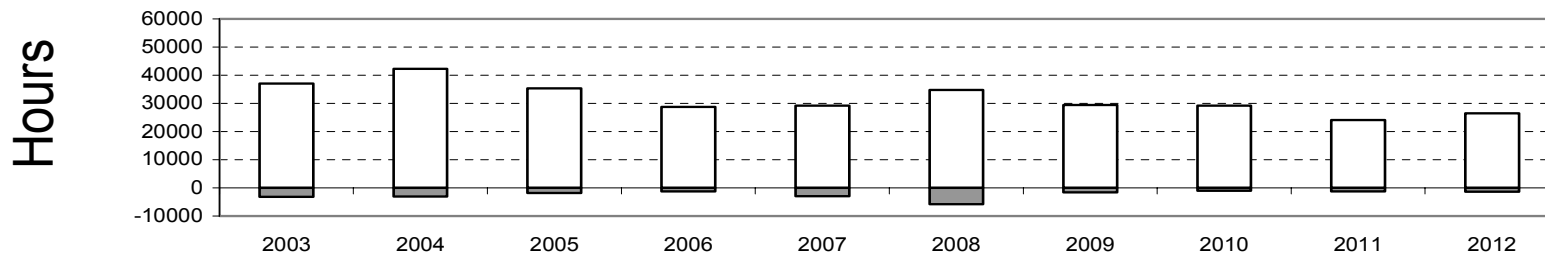


Projected Yearly Supportable Time Summary

70M



34M



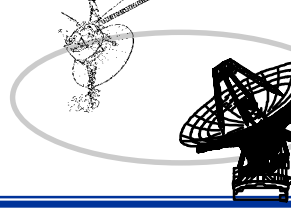
26M



Unshaded Area = Supportable

Shaded Area = Unsupportable

RESOURCE ALLOCATION REVIEW



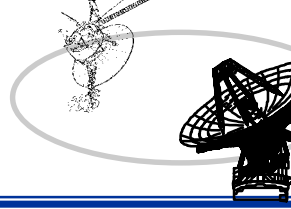
Action Item Summary

<i><u>AI#</u></i>	<i><u>CP#</u></i>	<i><u>Year</u></i>	<i><u>Month(s)</u></i>	<i><u>Week(s)</u></i>	<i><u>Subnet</u></i>	<i><u>System</u></i>	<i><u>Responsible</u></i>	<i><u>Due Date</u></i>	<i><u>Status</u></i>
01	All	2003	pre-Nov. '03	All	All	DSS	A. Salazar	10/21/2001	Closed

ACTION: DSMS Operations Office shall assess the overall impact of the recommendations to reduce Preventative Maintenance on the all Subnets and to provide the Resource Allocations Planning Team with a risk and budgeting assessment of whether additional maintenance hours are needed. The board noted that many of the Contentions identified in 2003 use DSS Maintenance to relieve the over-subscription and requested that they evaluate the readiness needed to prepare for the expected sustained high use in late 2003 through early 2004. This action should reference the opportunity to perform maintenance activities during extended downtime for all antennas in the nine-month period in late 2002 through early 2003.

RESPONSE: DSS Maintenance will accept the agreements made at the August RARB. They will continue to monitor the level of maintenance at the antennas.

RESOURCE ALLOCATION REVIEW

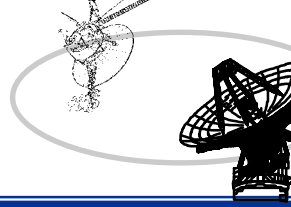


Action Item Summary

<i>AI#</i>	<i>CP#</i>	<i>Year</i>	<i>Month(s)</i>	<i>Week(s)</i>	<i>Subnet</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
02	N/A	N/A			70M	SVLB	V. Altunin	10/21/2001	Closed

ACTION: Request change of name from Space VLBI to something without the word Space. The name causes confusion between two separate but required activities. One is to provide support to an orbiting spacecraft (HALCA, a.k.a. VSOP); the DSN uses 11 meter and 26 meter antennas to track the spacecraft. The second is to co-observe the same radio source as the spacecraft with ground-based radio telescopes; the DSN currently supports using 70-meter antennas at certain frequencies.

RESPONSE: The name has changed to Mission Enhancement by Ground-based Astronomy (MEGA). Currently, the PSLA for this ground-based activity shows requirements to support HALCA through 2/1/02 and FAME in 2002-2005.

RESOURCE ALLOCATION REVIEW**Action Item Summary**

<i><u>AI#</u></i>	<i><u>CP#</u></i>	<i><u>Year</u></i>	<i><u>Month(s)</u></i>	<i><u>Week(s)</u></i>	<i><u>Subnet</u></i>	<i><u>System</u></i>	<i><u>Responsible</u></i>	<i><u>Due Date</u></i>	<i><u>Status</u></i>
03	14	2003	June – July	26-29	34H	MER	B.J. Erickson	9/21/2001	Closed

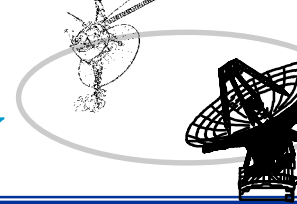
ACTION: MER B shall specify the launch period for the spacecraft. This will clarify the contention and may alter the recommendation for this period.

RESPONSE: Presently the MER B launch period begins June 25 and concludes July 12, 2003.

<i><u>AI#</u></i>	<i><u>CP#</u></i>	<i><u>Year</u></i>	<i><u>Month(s)</u></i>	<i><u>Week(s)</u></i>	<i><u>Subnet</u></i>	<i><u>System</u></i>	<i><u>Responsible</u></i>	<i><u>Due Date</u></i>	<i><u>Status</u></i>
04	16	2003	Oct. – Nov.	43-46	34H	RAT	N. Lacey	10/21/2001	Closed

ACTION: Resource Analysis Team shall redistribute the support load so that MER A receives no greater than 20 percent of its support using DSS-55. In addition, MER B noted that they could be scheduled on DSS-55 to support subnet overloads as necessary.

RESPONSE: The Resource Analysis Team has redistributed the planned MER A and MER B support on DSS-55 as requested.

RESOURCE ALLOCATION REVIEW**Action Item Summary**

<i>AI#</i>	<i>CP#</i>	<i>Year</i>	<i>Month(s)</i>	<i>Week(s)</i>	<i>Subnet</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
05	27,31	2003	Sept. – Dec.	39-51	26M	RAT SOHO	N. Lacey R. Bush	9/14/2001	Closed

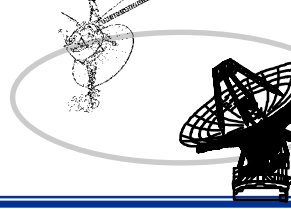
ACTION: Due to RARB recommended and project acceptance of deletion for the last four weeks of Helio-Seismology Observation (HSO) in 2003, the SOHO project requested another 30-day period earlier in 2003 to replace this lost observation.

RESPONSE: SOHO accepted the alternate recommendation of continuous coverage during weeks 4-7 (Jan. - Feb.) in 2003.

<i>AI#</i>	<i>CP#</i>	<i>Year</i>	<i>Month(s)</i>	<i>Week(s)</i>	<i>Subnet</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
06	41	2004	January	1	34H	CAS DEEP MER A/B	R. Mitchell J. McKinney J. Erickson	11/21/2001	Closed

ACTION: MER A & B in their Approach phase shall resolve contention support from Canberra and Spain in the first 6 days of week 1 in 2004 with Cassini Gravitational Wave Experiment and Deep Impact's use of two 34 meter antennas for initial acquisition (Canberra).

RESPONSE: A new recommendation has been proposed in this review.

RESOURCE ALLOCATION REVIEW**Action Item Summary**

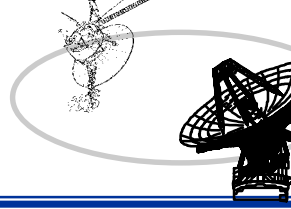
<i>AI#</i>	<i>CP#</i>	<i>Year</i>	<i>Month(s)</i>	<i>Week(s)</i>	<i>Subnet</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
07	41-44	2004	January	1-4	34H	MER A/B CAS	J. Erickson R. Mitchell	6/1/2002	Open

ACTION: Provide MER A & B Landing Site coordinates one year prior to launch. This will allow better planning of antenna usage in January 2004 during surface operations.

<i>AI#</i>	<i>CP#</i>	<i>Year</i>	<i>Month(s)</i>	<i>Week(s)</i>	<i>Subnet</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
08	46	2004	January	1	34B1	MER A	J. Erickson	10/21/2001	
			Closed						
						NOZO	A. Chang		

ACTION: MER A to study impact of either removing DSS-24 from EDL array in order to provide post MOI support to Nozomi TCM or to investigate the option of maintaining the array while providing MSPA and uplink support to Nozomi from DSS-24.

RESPONSE: This support should be feasible if DSS-24 is primarily dedicated to Nozomi and the MER A EDL support (X-band RCP signal) will use the Radio Science Receiver (RSR). MER A should not need the Block V Receiver (BVR). Of course there are many operational considerations and variables in this action that still need to be understood.

RESOURCE ALLOCATION REVIEW**Action Item Summary**

<i>AI# CP#</i>	<i>Year</i>	<i>Month(s)</i>	<i>Week(s)</i>	<i>Subnet</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
09 47	2004	January	2	34B1	DEEP MEX	J. McKinney R. Horttor	2/1/2002	Closed

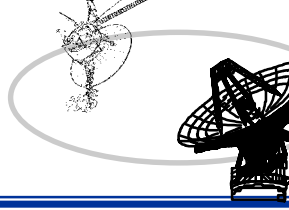
ACTION: Deep Impact shall evaluate the impact of taking regular gaps in post-launch coverage due to Mars Express Orbiter's post MOI support needs over DSS-54.

RESPONSE: A new recommendation has been proposed in this review.

<i>AI# CP#</i>	<i>Year</i>	<i>Month(s)</i>	<i>Week(s)</i>	<i>Subnet</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
10 49	2004	January	4	34B1	ULYS	I.J. Webb	10/21/2001	Closed

ACTION: Ulysses shall investigate the possibility of using a non-DSN antenna for support or taking a regular two hour gap at Madrid (DSS-54).

RESPONSE: Ulysses will accept a two hour gap at Madrid.



Nasa Headquarters

Perspective

- CODE S -



Barry Geldzahler



OSS News

**Presentation to the
Resource Allocation Review Board
Feb 12, 2002**

**Dr. Barry Geldzahler
Program Executive for Space Operations
Solar System Exploration Division
Office of Space Science - NASA Headquarters
202-358-0512 bgeldzah@hq.nasa.gov**

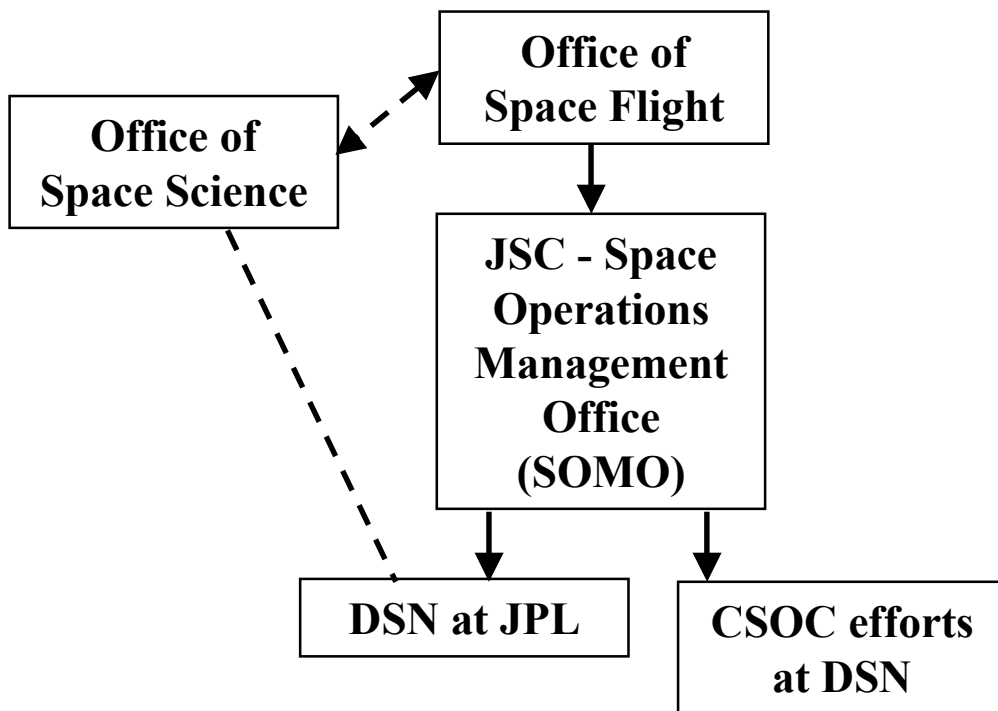
- **Management of the DSN**
- **Working groups**
- **Positions available at HQ**
- **Peer Reviews**
- **Prioritization Board**



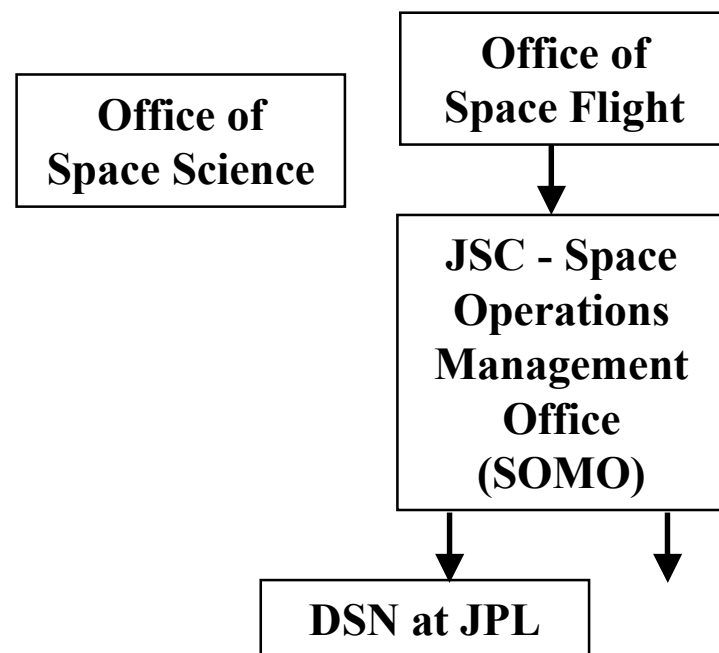
Management of the DSN What it was [pre-FY02]



Management Flow



Budget Flow



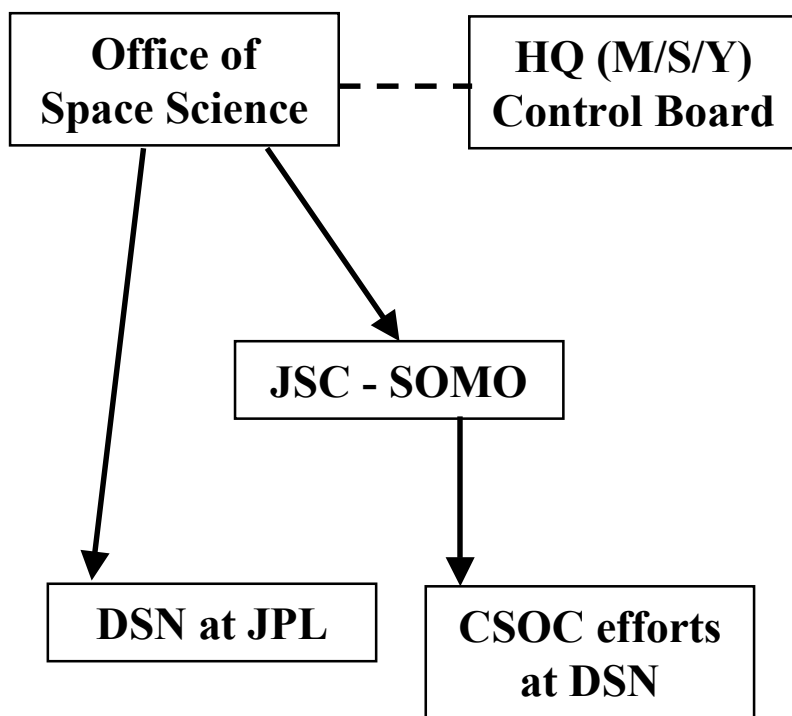


Management of the DSN

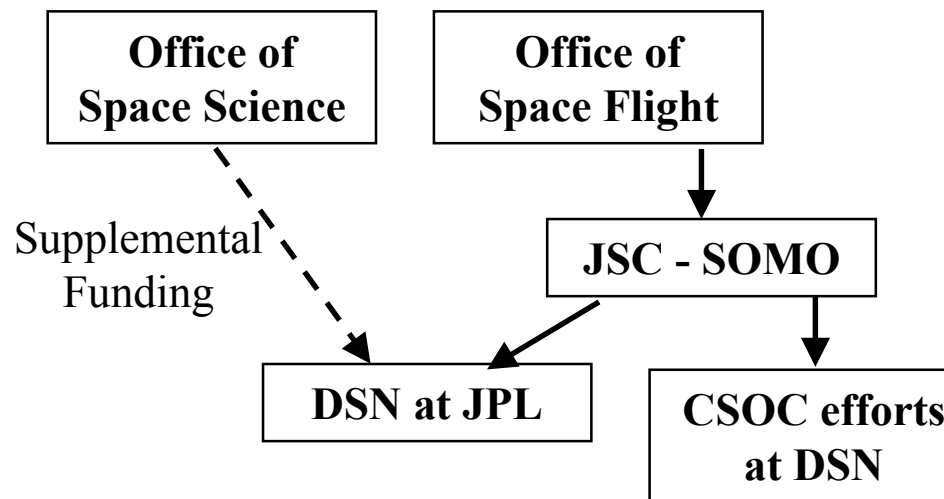
What it is [FY02]



Management Flow



Budget Flow

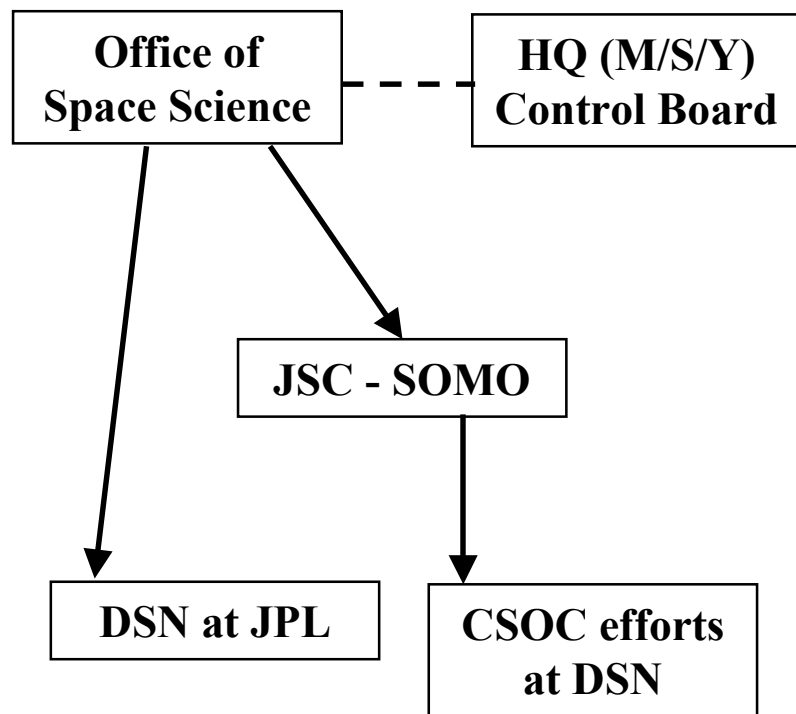




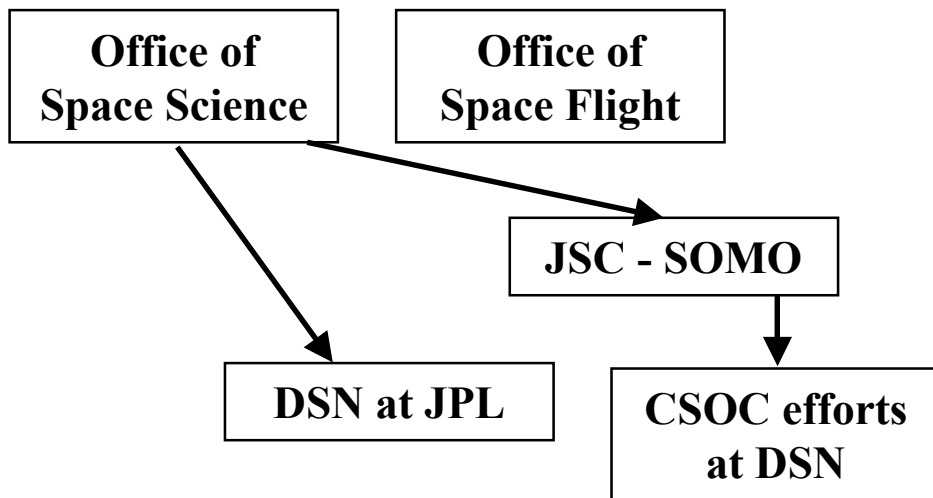
Management of the DSN What it will be [post-FY02]



Management Flow



Budget Flow





Transition Period: FY02-03

Management and Budget Flow for DSN



- Requirements are determined by the User Code
- Budget is held and distributed by the User Code
- User Codes work with OSF's Space Access organization to:
 - ◆ Work cross-Enterprise issues



FY02-03 Management Budget Flow for DSN Services



DSN Services at JPL:

- OSS will determine the requirements for DSN Services
- During FY02, OSF will hold and distribute funds during FY02, as agreed during the FY03 budget process; OSS will supplement funds for DSN by diversion from other OSS programs, as agreed.
- During FY03, all DSN funds (including supplements diverted from other OSS programs) will be held in OSS, and will be dispersed to DSN and via CSOC or other contractor[s]



Role of the HQ Coordination and Integration Board for Space Communications



The Space Communications Coordination and Integration Board will coordinate and integrate cross-cutting issues such as:

- Network priorities and capacities
- Reporting metrics for space communications
- Communications and data system architecture
- Technology developments to avoid duplication
- Control and data standards
- Spectrum Management



Prioritization Board

- **HQ has established a Prioritization Board to help resolve conflicts during the 2003/04 crunch period.**
- **The RAPSO process will be the first steps**
 - **s/c emergency**
 - **mandatory for achievement of primary object. Support essential to s/c survival**
 - **major, unique scientific event. Time critical**
 - **minimum DSS maintenance; minimum support to maintain scientific validity**
 - **mandatory to achieve primary objectives - not time critical**
 - **time critical events not essential to achieving primary objectives**
 - **repeated scientific objectives**
- **If an impasse remains, the decision will be made at HQ.**
- **The HQ group will be set up this year and will provide guidance to RAPSO**
- **First meeting, Jan 17, 2002, at HQ to help resolve conflicts in the current cycle and to get practice for the 2003/04 armada**



Executive Management Board

- NASA HQ is establishing an Executive Management Board to help determine upgrades and operations issues
- Will help NASA HQ DSN Program Executive weigh options for future DSN initiatives
- The Board will meet every 6 months



Peer Reviews

- Senior Review of Astronomy and Physics Operating Missions
 - to be held in Summer 2002
- Planetary Data System Requirements Review
 - Held in November 2001
 - Reviewed end-to-end process and charter of PDS

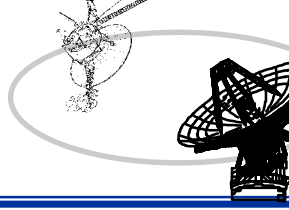


New Positions in Code S

- Mars Exploration Discipline Scientist – Permanent Civil Servant, GS-13/14/15 – To be re-advertised (open date TBD)
- Mars Smart Lander Program Scientist – Permanent Civil Servant GS-13/14/15 - To be advertised (open date TBD)
- Discovery Program Scientist – GS-13/14/15 – To be advertised (open date TBD)
- Mars Scout Program IPA
- Planetary Instrument Design & Development Program (PIDDP) IPA



RESOURCE ALLOCATION REVIEW



JPL DSMS

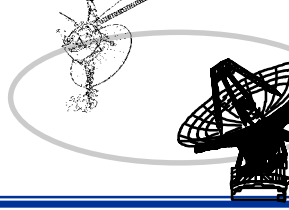
Plans and Commitments Office

RARB 12 Feb 2002

Alternate Assets and Triage



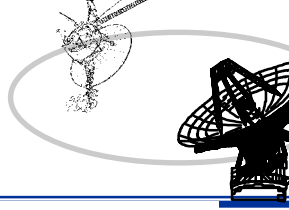
Rich Miller



RESOURCE ALLOCATION REVIEW

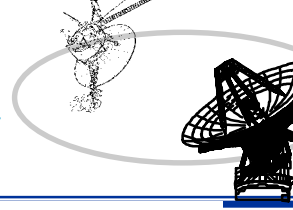
Alternate Assets

- '03-'04 Augmentation resulted in:
 - Additional BWG in Madrid
 - 20kW transmitters in BWG
 - Accelerated Network Simplification Project
 - Arraying in Canberra and Madrid
- Residual Risk Assessment resulted in request to look at alternate assets
 - Non-primary use: in event DSN antenna fails or spacecraft emergency forces mission off of DSN
- Result is two in Australia:
 - ESA's New Norcia 35m tracking station
 - ATNF's Parkes 64m Radio Telescope



New Norcia

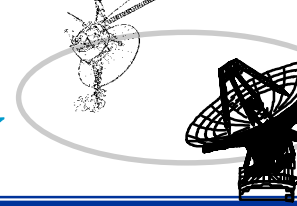
- Completes this summer
- Command and Telemetry with performance about the same as current DSS 34 (the poorest performance DSN BWG). SLE interface to JPL. No MCD-3.
- Reverse SLE means AMMOS Project interface the same as for DSN site except for reduced monitor data. RMD interface is a future implementation.
- Important as pathfinder for all non-DSN Deep Space Tracking Assets
- Prime use of the station is for Rosetta and MEx, therefore support will not be scheduled ahead and mission we send there (due to DSN failure or S/C emergency bumping off the DSN) must be higher priority than MEX or Rosetta at the time.
- Should be possible to get a command in to switch from length 15 coding before leaving the DSN station (if it wasn't the station that failed).



RESOURCE ALLOCATION REVIEW

Parkes

- Telemetry only but with DSN equipment (after the LNA), no MCD-3. Nearly twice a BWG and 1/2 a 70m performance. This means if were scheduled for 34m MCD-3 usage will get higher telemetry performance at length 7 Parkes than would have at length 15 at DSS 34 or DSS 45.
- Intended usage is again if DSN Antenna fails or S/C emergency kicks a mission off DSN. Will be on-call, but will schedule during most critical period, say mid-December through end of January so can be hot stand-by. We should schedule a mission that would otherwise not have gotten a track to use Parkes while it is standing-by (Odyssey, which others?).
- Since missions are planning downlink only usage as a part of MSPA, it should be possible to utilize a one-way Parkes track if we have an MSPA'ing antenna go down, or a S/C emergency force us out of MSPA mode.



RESOURCE ALLOCATION REVIEW

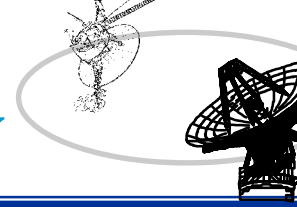
Project Views

Mission	MCD-3 user	New Norcia	Comment	Parkes	Comment
MGS		Yes *		Yes	
Odyssey	Yes	Yes	Pref back up with MCD-3. 70m request 14hr/day Prefer 1/4 to 0 data.	Yes. Sched when can't get 14hr 70m	Pref back up with MCD-3. 70m request 14hr/day Prefer 1/2 to 0 data.
Stardust		Yes	Primary need is RMD. Playback designed for 70m. OK for Safe mode Cmd & Tlm	Yes	Primary need is RMD. Playback designed for 70m. OK for Safe mode Cmd & Tlm
MER A & B	Yes	No		No	
Contour		No	RMD critical in Nov. Data not through JPL. Proj cool to back up.	No	RMD critical in Nov. Data not through JPL. Proj cool to back up.
Cassini		Yes	Radio Science driven Yes for Tlm & Cmd only	Yes	Radio Science driven Yes for Tlm only.
SIRTF		Yes	Data dumps every 12 hours. Need to command start	Yes	Data dumps every 12 hours. Need to command start at DSN
Uly		Yes		Yes	Acceptable only if no uplink needed that track
Voy		Yes		Yes	Acceptable only if no uplink needed that track

Yes * means acceptable to Project vs. no data at all if kicked off DSN site.

In most cases will not meet requirements and will result in reduced data return.

10-Feb-98



RESOURCE ALLOCATION REVIEW

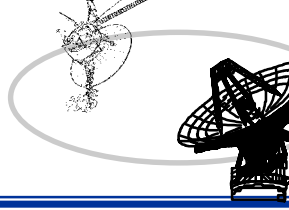
Draft Recommendation

Mission	MCD-3 user	New Norcia	Comment	Parkes	Comment
MGS		2		2	
Odyssey	Yes	1	Pref back up with MCD-3. 70m request 14hr/day Prefer 1/4 to 0 data.	1	Pref back up with MCD-3. 70m request 14hr/day Prefer 1/2 to 0 data.
Stardust		3	Primary need is RMD. Playback designed for 70m. OK for Safe mode Cmd & Tlm	3	Primary need is RMD. Playback designed for 70m. OK for Safe mode Cmd & Tlm
MER A & B	Yes	No		No	
Contour		No	RMD critical in Nov. Data not through JPL. Proj cool to back up.	No	RMD critical in Nov. Data not through JPL. Proj cool to back up.
Cassini		4	Radio Science driven Yes for Tlm & Cmd only	4	Radio Science driven Yes for Tlm only.
SIRTF		5	Data dumps every 12 hours. Need to command start	5	Data dumps every 12 hours. Need to command start at DSN
Uly		Yes *		7	Acceptable only if no uplink needed that track
Voy		6		6	Acceptable only if no uplink needed that track

Numbers are priority order for implementation. Expect in ESA case may only do first 3.

*Uly will have been done by ESA as a test vehicle

10-Feb-98



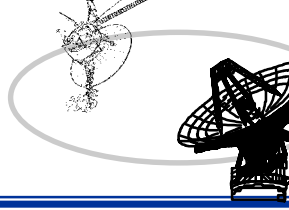
Need for Triage Negotiations

Needed future work by us all:

- Foresee need to pre-negotiate Time Phased Triage Agreements
- Arraying
 - Conceived as means to partially back up a failed 70m
 - Fully at Goldstone
 - 3/4 at Madrid
 - 1/2 at Canberra
 - Is there a circumstance where a mission on a 70m was at such a critical point bumping all other missions off that longitude of the DSN would be acceptable?



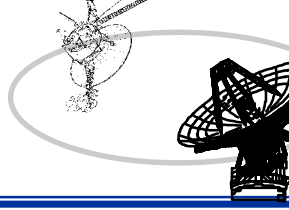
RESOURCE ALLOCATION REVIEW



JPL DSMS Engineering Program Office



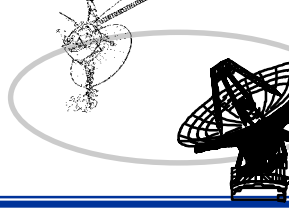
Joe Statman



Agenda

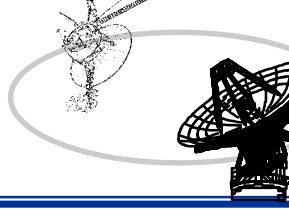
- Tasks recently completed
- Tasks to be completed before the '03-'04 heavy loading
- Tasks to be completed after FY03
- Decommissioning

Consult your TMS Manager for details of schedule and functional capabilities



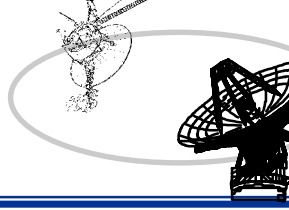
Tasks recently completed

- 26m automation
- 70m X-band Uplink
- NMC 1.3, 1.3.1
- Uplink D2
- Arraying



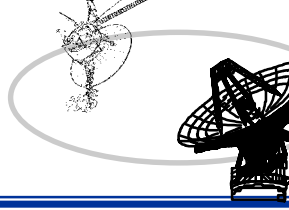
26m Automation

- WHAT:
 - Add a remotely-controlled 2kW transmitter, replace the telemetry and command processors with COTS-based products, added SLE capability
- WHEN:
 - D3 deployed at all DSCC. D3.1 (bug cleanup & SLE) in 4/02
 - Integral is first SLE user on the 26m
- IMPACT ON CUSTOMERS:
 - Better timing resolution
 - Elimination of external/internal bit-synchs
 - 20kW transmitters remain but require manual operations



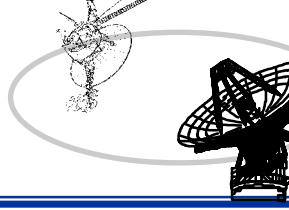
70m X-band Uplink

- WHAT:
 - Install 20kW X-band transmitters at the 70m antennas
- WHEN:
 - Last installation, at MDSCC, completed in 10/01
- IMPACT ON CUSTOMERS:
 - X-band capability on all 70m antennas
 - Routine support
 - Emergency



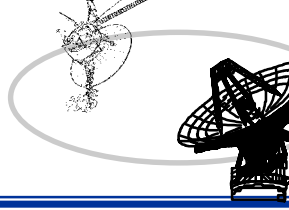
NMC 1.3, 1.3.1

- WHAT:
 - New M&C system at the DSCC's, enables SOE/DKF-based operations, for the 34/70m antennas. Uses a Time-Dependency-Network (TDN) to automate the pre-pass and post-pass activities
- WHEN:
 - D1.3 deployed in fall 2001, D1.3.1 (bug fixes) deployed 1/2002
- IMPACT ON CUSTOMERS:
 - Ability to streamline operations
 - Requires complete and accurate DKF/SOE inputs
 - TDN's for pre-pass and post-pass are usable now
 - TDN for in-pass are in development



Uplink D2

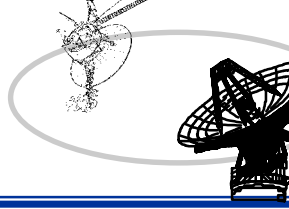
- WHAT:
 - Modern uplink hardware & software, replaces the aging CMA/CPA for the 34/70m antennas
- WHEN:
 - Deployed in Fall 2001
 - All JPL missions will use SLE
 - The new AMMOS command system is based on SLE
 - CONTOUR is first non-JPL user
- IMPACT ON CUSTOMERS:
 - Interface changes



Arraying

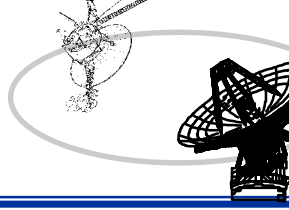
- WHAT:
 - Add a capability to array antennas in a DSCC, to create an effective larger antenna
 - Available only at GDSCC
- WHEN:
 - 2/2001, verification with NMC 1.3 underway
- IMPACT ON CUSTOMERS:
 - Becoming available

RESOURCE ALLOCATION REVIEW



Tasks to be Completed Before the '03-'04 Overload

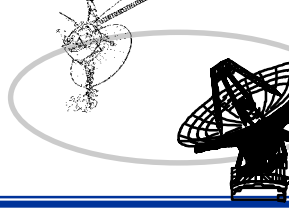
- X/X/Ka-band feeds
- DSS 55
- 20kW transmitters on BWG's
- 2-MSPA
- Arraying at Overseas DSCC's
- Delta-DOR
- NSP
- NMC 1.4



X/X/Ka feeds

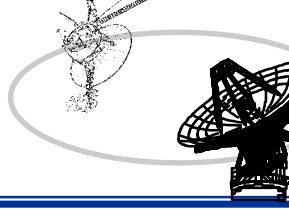
- WHAT:
 - Replace the X/X feeds at the BWG's with X/X/Ka-band feeds
- WHEN:
 - Operational – varies by antenna
 - DSS 26 – 4/2003
 - DSS 55 – 11/1/03
- IMPACT ON CUSTOMERS:
 - Ka-band downlink capability
 - Improved X-band BWG downlink sensitivity at X-band
 - 0.5-2.5dB depending on the operations mode and reference antenna

RESOURCE ALLOCATION REVIEW



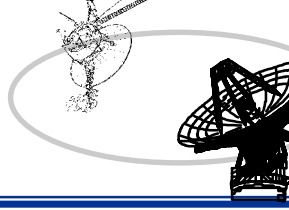
DSS 55

- WHAT:
 - Add a new antenna, a 34m BWG at MDSCC
- WHEN:
 - Operational – 1/11/03
- IMPACT ON CUSTOMERS:
 - Additional capacity



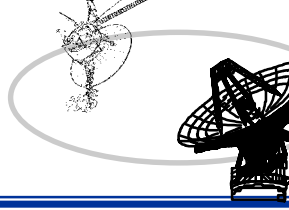
20kW Transmitters on BWG

- WHAT:
 - Replace the 4kW X-band transmitters with 20kW transmitters
- WHEN:
 - Varies by antenna
- IMPACT ON CUSTOMERS:
 - Better uplink capability
 - Same as HEF
 - Simplifies scheduling



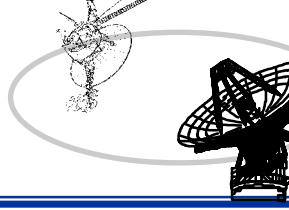
2-MSPA

- WHAT:
 - Simplify the operations to support the downlink from two (virtual) spacecraft that are in the same beam
- WHEN:
 - Operational – Spring '03
- IMPACT ON CUSTOMERS:
 - Additional effective capacity
 - Note limitations
 - Only one uplink
 - Must have compatible RF characteristics



Arraying at Overseas Stations

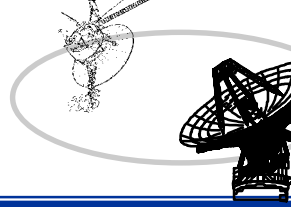
- WHAT:
 - Add arraying capability at MDSCC and CDSCC
- WHEN:
 - Operational – Summer '03
- IMPACT ON CUSTOMERS:
 - Additional capacity, especially when the 70m antenna is busy



Delta DOR

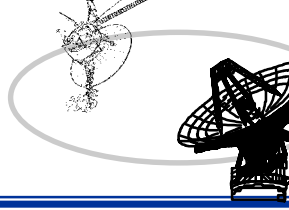
- WHAT:
 - Add a new navigation tool
 - Validates traditional radio metric measurements
 - Enables better targeting
- WHEN:
 - Operational – Spring '03, already used for Mars Odyssey
- IMPACT ON CUSTOMERS:
 - Additional tool for the navigation teams
 - Navigation strategy should be refined/adjusted as needed

RESOURCE ALLOCATION REVIEW



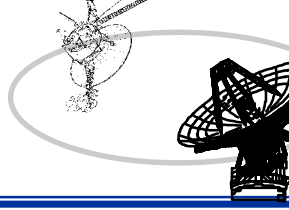
NSP

- WHAT:
 - Replace the telemetry/ranging/Doppler equipment for the 34/70m antennas
- WHEN:
 - Varies by antenna. Equipment already available at DSS 26
- IMPACT ON CUSTOMERS:
 - New interfaces
 - Some new capabilities, e.g. telemetry SLE, PRN ranging



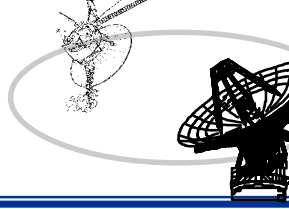
NMC 1.4

- WHAT:
 - Add a remote monitoring capability for the 34/70m antennas
- WHEN:
 - Operational – Summer '03
- IMPACT ON CUSTOMERS:
 - Replaces the MON-5-15 visibility with MON-0158 (similar content but different interface)



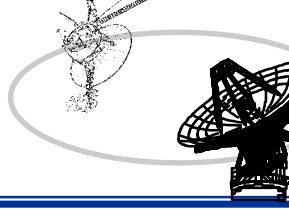
Turbo Code

- WHAT:
 - Add a new error-correcting method to all the 34/70m antennas
- WHEN:
 - Operational – 10/03
- IMPACT ON CUSTOMERS:
 - Better coding gain, e.g. by 0.8dB for a typical code, compared to MCD3
 - Note: The MCD3 is not available to new customers. Turbo code should be used as the high performance code



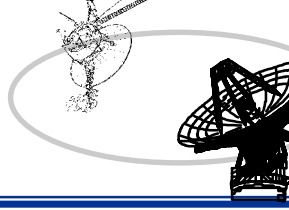
Tasks to be Completed After FY03

- X/X/Ka-band feeds
 - For the remaining BWG
 - Schedule is TBD
- Antenna controllers for the 70m and BWG
 - Will require significant downtime
- 70m refurbishment
 - Will require significant downtime



Decommissioning

- Modest decommissioning in near-term is planned
 - 11m antennas – mission completed
 - Equipment replaced by tasks, e.g.
 - Old radio science equipment
 - LMC/CMC/NOCC
 - Etc.
- Longer-term decommissioning
 - Driven by meeting customer needs within the budget
 - e.g. - S-band hi-power transmitters

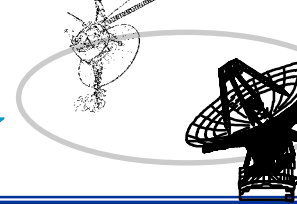


Summary

- We depend on the customers to:
 - Take advantage of the capabilities we have put in place
 - SLE, TDN's, arraying
 - Define what capabilities we should put in place
 - Beyond sustaining of current capabilities
 - Help us to select capabilities that are least cost-efficient as candidates for decommissioning
- Your input is priceless!



RESOURCE ALLOCATION REVIEW

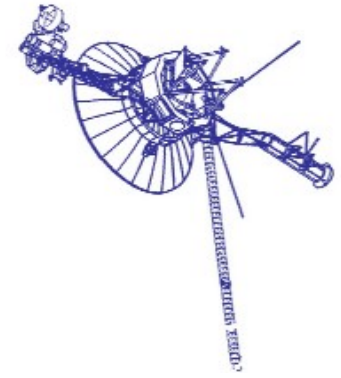


JPL DSMS Operations Program Office



A. Berman

InterPlanetary Network and Information Systems Directorate Deep Space Mission System



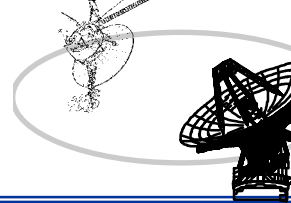
DSMS Operations Program Office (930)

Resource Allocation Review Board Meeting

Presented by
Allen L. Berman

February 12, 2002

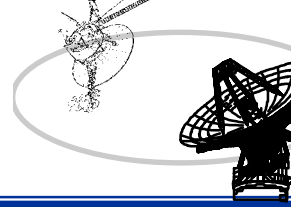




DSMS Operations Program Office

AGENDA

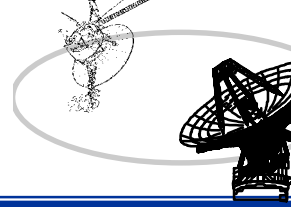
- 2001 DATA PERFORMANCE SUMMARY
- CURRENT OPERATIONS IMPROVEMENT ACTIONS
- 2002 OPERATIONS ENVIRONMENT
- 2003/2004 OVERLOAD - LONG RANGE OPERATIONS FOCUS



DSMS Operations Program Office

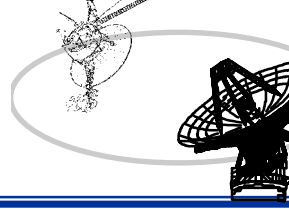
COMPOSITE DATA PERFORMANCE SUMMARY 2001 versus 2000

	<u>2001</u>	<u>2000</u>
• Telemetry	99.0%	99.1%
• Radio Metric	98.2%	98.7%
• Command	98.7%	99.1%
• Monitor	99.2%	99.6%
• Radio Science	99.4%	99.8%
• VLBI	98.1%	92.3%



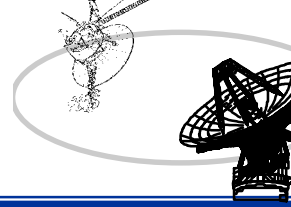
DSMS Operations Program Office

- RECENT ACTION TO STRENGTHEN OPERATIONS
 - CSOC
 - Additional NOPEs and OEs hired
 - Developed and is implementing a plan for retention of critical skills
 - Increased SA support to Projects
 - Overseas Communications
 - Capacity increased from 1.5 T1s to 2.0 T1s (1.5Mb/s to 2.2Mb/s)
 - DSN Operations *Standard Operations Plan* (841-001)
 - Completely reviewed, updated, and revised



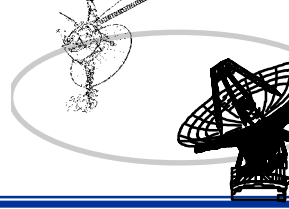
DSMS Operations Program Office

- RECENT ACTION TO STRENGTHEN OPERATIONS (Cont'd)
 - Initiated two new Operations Working Groups (JPL, CSOC, and Complex participants)
 - DOWG (DSMS Operations Working Group) - Provide essential leadership to ensure the development of a DSMS Operations architecture that provides for proficient operations and satisfaction of customer requirements
 - LOWG (Logistics Working Group) - Improve DSMS logistics operations, providing the best possible (and affordable) service to DSMS Operations



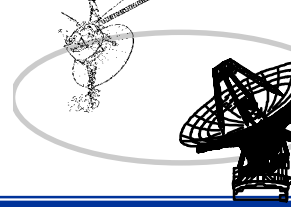
DSMS Operations Program Office

- 2002 OPERATIONS ENVIRONMENT
 - Launch and critical phase support relatively light
 - Major launches - only 2 (CONTOUR and INTEGRAL)
 - But, a very busy Engineering to Operations Delivery Schedule
 - NSP
 - 26-M Automation
 - NMC; Remote Monitoring
 - CS
 - SLE
 - NSP in particular will impose a heavy familiarization, training, and documentation burden on Operations
 - Additional Operations familiarization and training with 26-M Automation, NMC, and SLE (first use, CONTOUR and INTEGRAL)



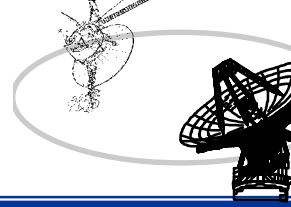
DSMS Operations Program Office

- 2003/2004 *OVERLOAD* -- LONG-RANGE OPERATIONS FOCUS
- 2003/2004 *OVERLOAD* A VERY UNFORGIVING ENVIRONMENT FOR OPERATIONS:
 - Three major implementations (NSP, DDOR, and Arraying) introduced with minimum time for training and low maturity
 - New OPS scenarios: MSPA, DDOR (multiple spacecraft) and Arraying
 - Numerous spacecraft in view at roughly the same time, with as many as 6 at Mars
 - Interfacing and coordination with foreign stations ("Alternate Assets")



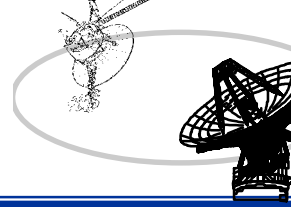
DSMS Operations Program Office

- 2003/2004 *OVERLOAD* A VERY UNFORGIVING ENVIRONMENT FOR OPERATIONS (Cont'd):
 - Multiple pre-tracks for every track (MSPA)
 - Different combinations of Spacecrafts and Critical Activities on every pass
 - Rapid uplink switching - multiple times per pass
 - Very quick failure detection and recovery required under more complex support scenarios and constraints
 - Multi-dimensional priorities - Missions, Spacecraft Emergencies, Critical Events



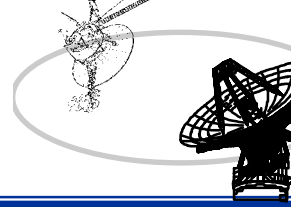
DSMS Operations Program Office

- 2003/2004 *OVERLOAD A VERY UNFORGIVING ENVIRONMENT FOR OPERATIONS (Cont'd)*:
 - Ground failure or procedural error could cause loss of key data or lead to major resource reallocation
 - Minimal time for repair and maintenance on a lot of new, immature equipment (NSP)
 - Particularly, antenna maintenance (including dark hours)
 - Extended period of stress for Operations Personnel



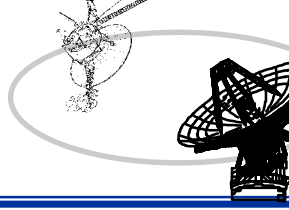
DSMS Operations Program Office

- OPERATIONS BUDGET INCREASED TO FORTIFY OPERATIONAL CAPABILITY IN 2003/2004
- ACTIONS PLANNED FOR INCREASING OPERATIONAL CAPABILITIES AND ROBUSTNESS IN 2003/2004
 - Performance Analysis - new positions for system analysis
 - Tracking Support Specialists (in NOCC) - new positions to assist in coordination and problem recovery
 - NSS Software Upgrades for the 2003/2004 overload period, Delta DOR, MSPA
 - Possible increase in NOPEs



DSMS Operations Program Office

- ACTIONS PLANNED FOR INCREASE OPERATIONAL CAPABILITIES AND ROBUSTNESS IN 2003/2004 (Con'td)
 - Increased Complex maintenance personnel
 - Will be exploring, with all Complexes, additional measures to increase operational robustness (at the Operations and Engineering Workshop later this month)



New or Modified Project Requirements - NEW HORIZONS -

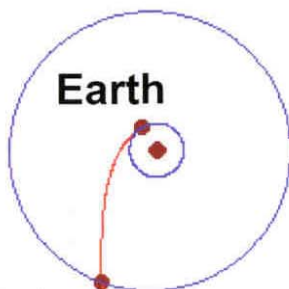


Johns Hopkins University Applied Physics Laboratory

Bob Farquhar



PKB Mission Profile



Earth

Jupiter Flyby
March 10, 2007

Launch: January 10, 2006
 C_3 : 155 km²/sec²

Flight time: 10.5 years

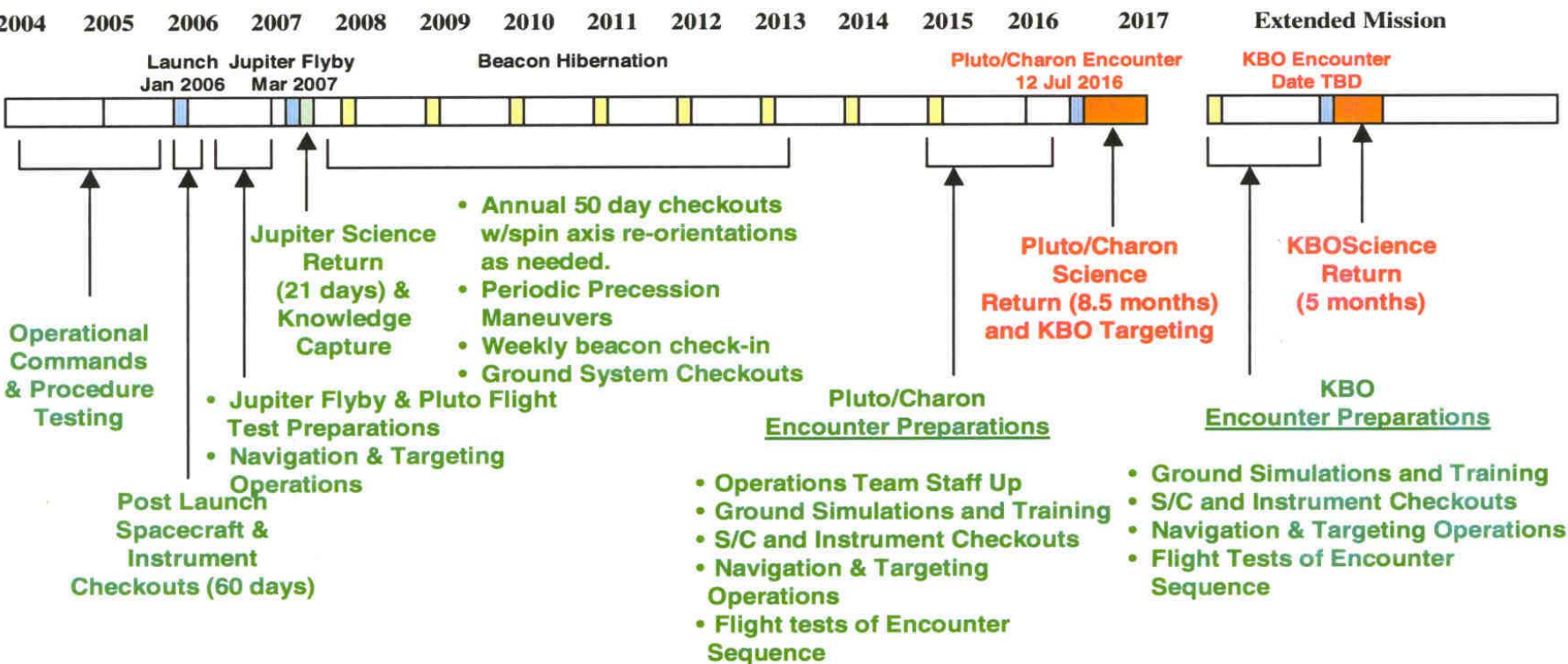
Jupiter Flyby Parameters		Pluto Encounter Parameters			
Distance (R _J)	V _∞ (km/s)	Sun Distance (AU)	Earth Distance (AU)	Phase Angle (deg)	V _∞ (km/s)
38.3	20	33.1	32.1	18	12.2

Pluto Arrival
July 12, 2016



New Horizons

Mission Operation Timeline and Goals





PKB DSN Schedule

(2006 Launch – 2016 Pluto Arrival)



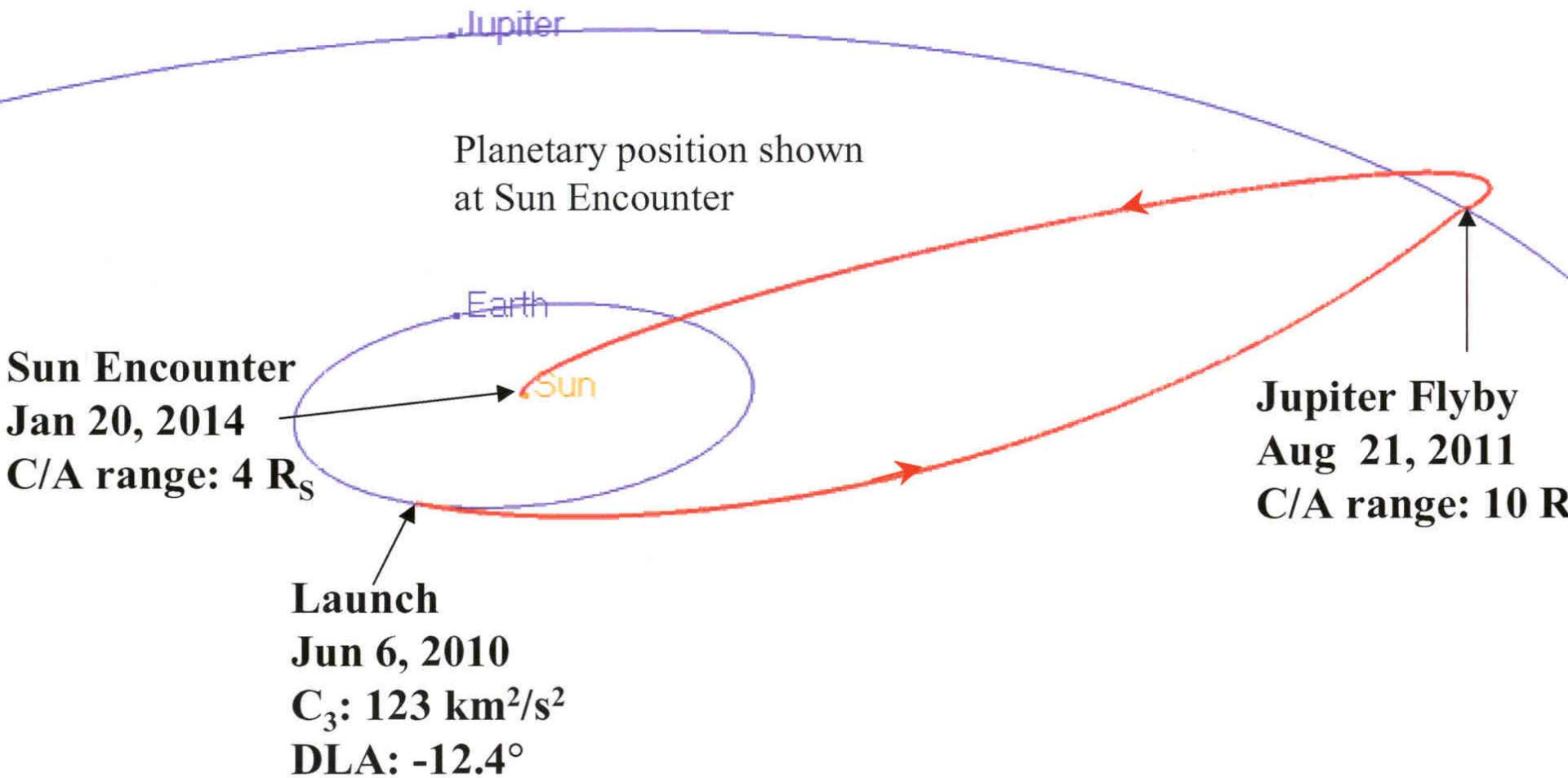
Mission Phase	Period (days)	DSN Contact	DSN Antenna
Early Operations	L to L+6	Continuous	34 m
	L+7 to L+20	7 h/d	34 m
	L+21 to L+60	5×7 h/wk	34 m
First Cruise	L+61 to J-61	2×7 h/wk	34 m
Jupiter flyby	J-60 to J-31	3×7 h/wk	70 m
	J-30 to J-4	7 h/d	70 m
	J-3 to J+3	Continuous	70 m
	J+4 to J+40	3×7 h/wk	70 m
Second cruise	J+41 to P-151	†Beacon hibernation mode	34 m until 10 AU
		‡One checkout every 12 months	70 m
		*Precession maneuvers outside checkout	70 m
Pluto encounter	P-150 to P-41	3×7 h/wk	70 m
	P-40 to P-21	7 h/d	70 m
	P-20 to P	Continuous	70 m
Science data playback	P+1 to P+11	Continuous	70 m
	P+12 to P+250	30 d cycle (26 × 9 h/d, 4 d Continuous)	70 m

† Beacon hibernation mode is 1× 1.5 h/wk (carrier only)

‡ Checkout is 50 d operations, 2× 8 h/wk, 1st checkout 6 months after JGA, then yearly

* Four 8h/d for 7d on 2/15/08, 2/20/09, 2/17/12, 3/27/15

Solar Probe Trajectory

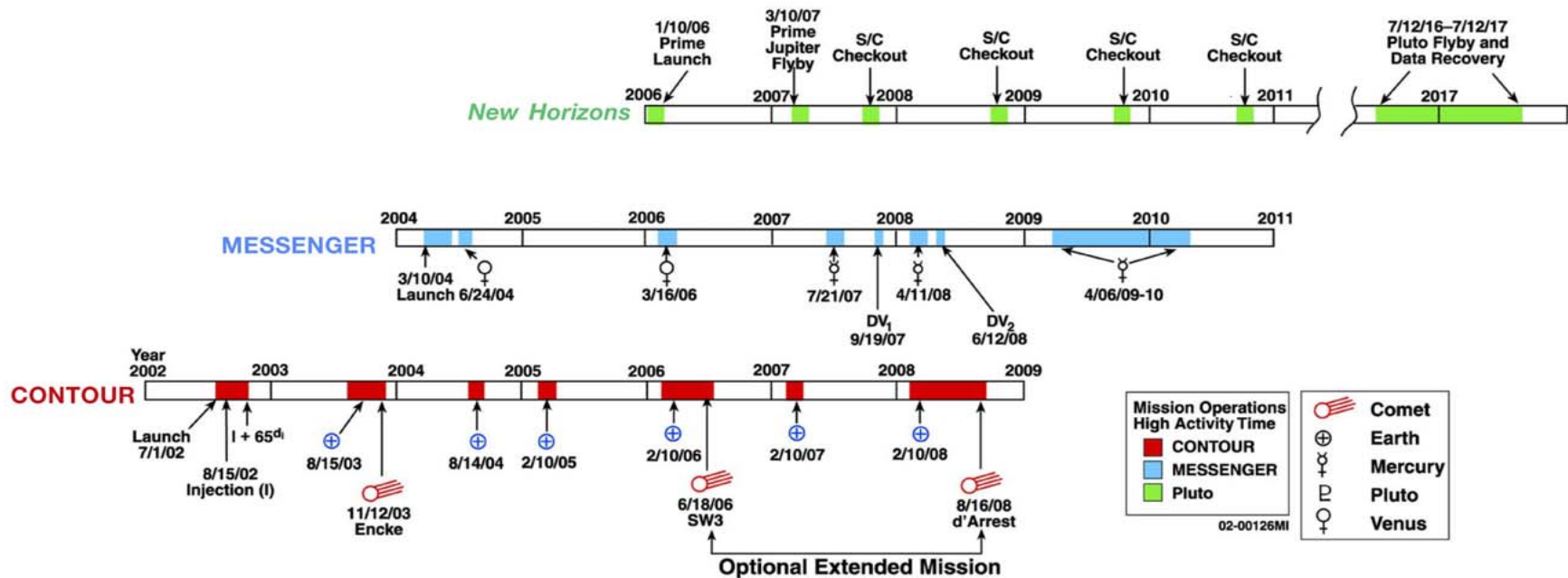




Planetary Mission Operations at APL

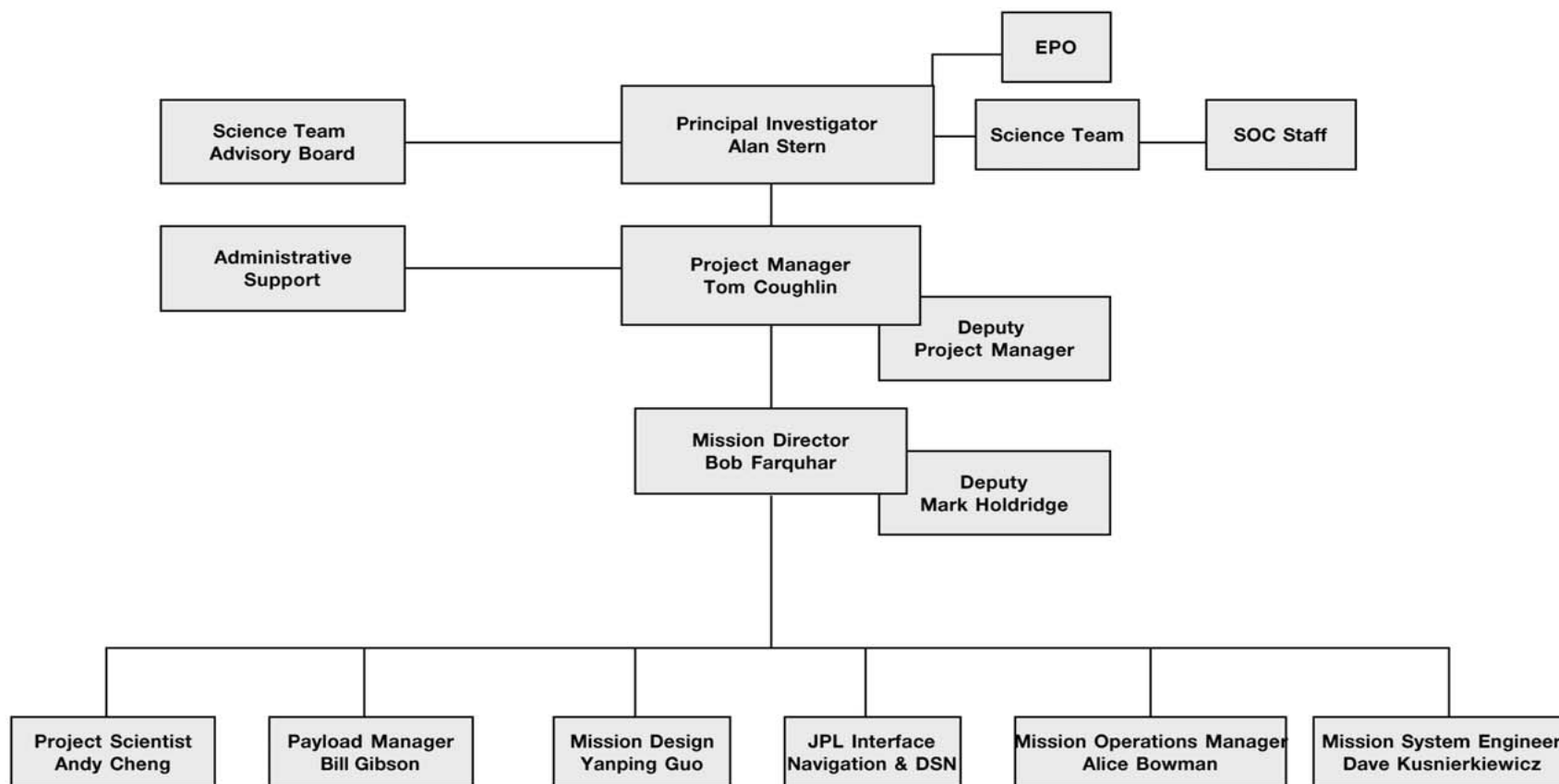


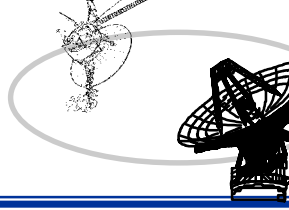
The combined APL planetary operations team will provide continuity to each individual operation and the resources required for periods of intensive flight operations.





Organization: Post-Launch





New or Modified Project Requirements - ST-5 -



Irene Bibyk



DSN RARB – ST- 5 Overview

Irene Bibyl
ST-5 Ground System Manager

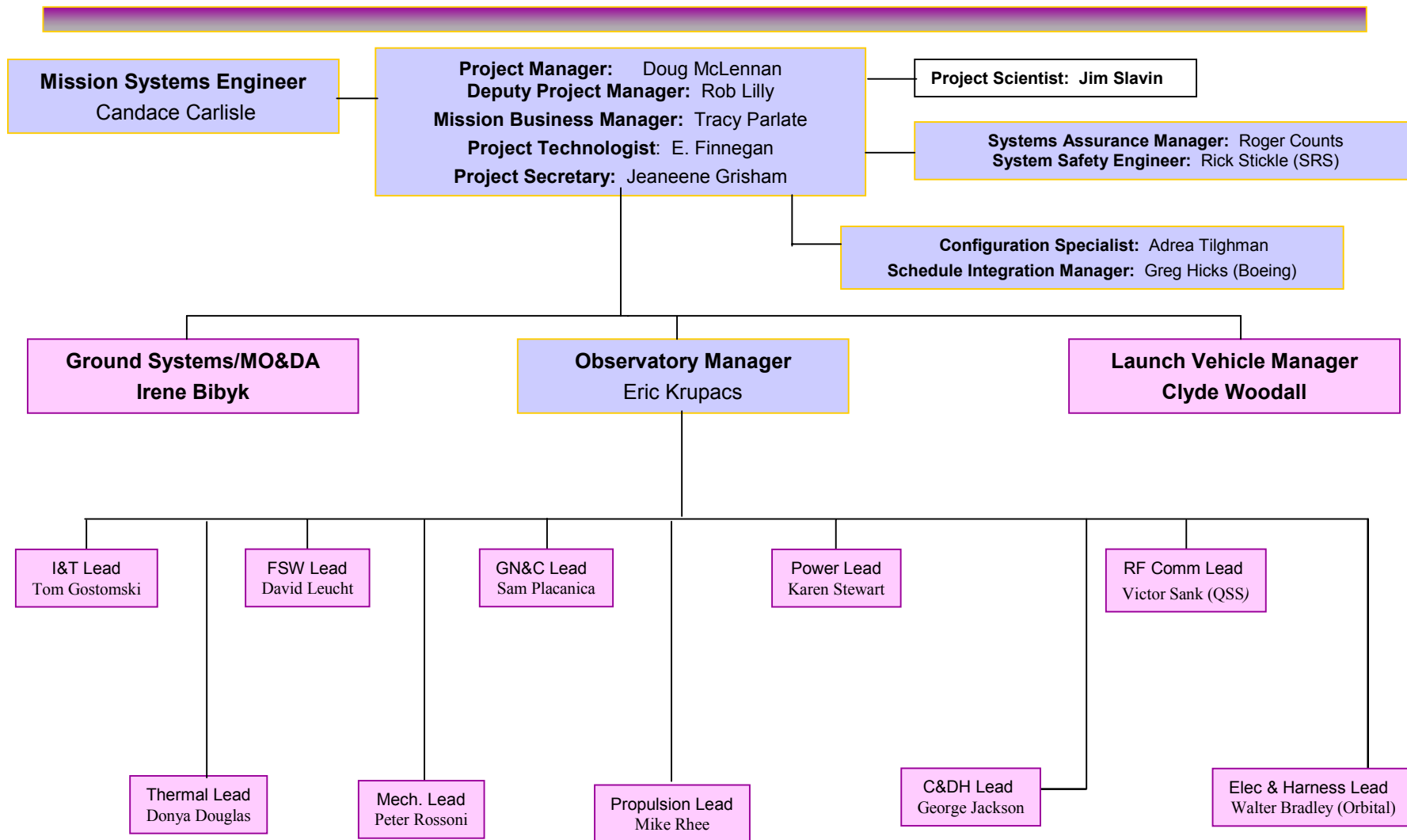
Introduction

- ST-5 (Space Technology – 5) Facts
 - NASA, Code S, New Millenium Program
 - Launch Readiness Date is May 31, 2004
 - Secondary payload candidate
 - 3 spacecraft, all on same carrier frequencies, 3 separate S/C IDs
- Presentation Agenda
 - ST-5 Organization
 - ST-5 Mission Overview
 - Mission Operations Requirements
 - Ground System Requirements
 - Ground System Milestones



Organization Chart

SFC



Product Design Leads (PDL)

Project Personnel

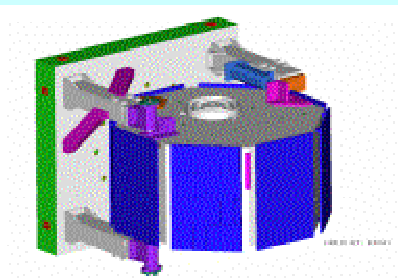
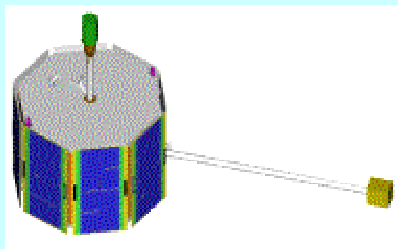


ST-5 Mission Overview



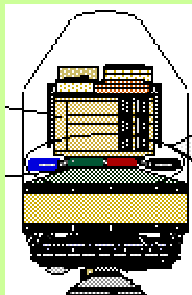
Mission Summary

Spacecraft



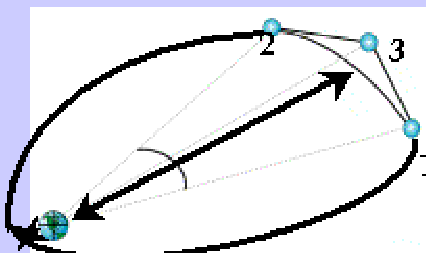
- **Full Functional Autonomous Spacecraft with Integrated Technology Development**
- **Science Grade Magnetic Sensitivity ($\sim 0.1\text{nT}$)**
- **Mass: $\leq 25\text{Kg}$**
- **Size: Diameter $\sim 50.8\text{ cm}$ (Flat-to-Flat)
Height $\sim 30.5\text{ cm}$ (Deck-to-Deck)**
- **Power: $\sim 21.5\text{W}$ - in review (Usable for Load)
 $\sim 7.5\text{ Ah}$ Battery**
- **Uplink: @ 1Kbps / Downlink: @ 1Kbps or 100Kbps (X-Band)**
- **Data Storage: .. 10 Mbyte - in review**
- **Spin Stabilized at Separation ($\sim 20\text{ RPM}$ After Deployments)**
- **Deployments: Magnetometer**
- **Radiation Tolerant $100\text{Krad-Si}/3\text{ Months}$**

Launch



- **Ride: Assuming Boeing Delta IV**
- **Orbital Injection: Geosynchronous Transfer Orbit ($200 \times 38,000\text{Km}$)**
- **Secondary Payload**

Mission



- **3-Spacecraft Constellation**
- **3-Month Design Life**
- **$\sim 10.5\text{ Hr}$ Orbit Period**
- **20-30 Minute Ground Contact Per Orbit**
- **Autonomous Constellation Management / "Lights Out" Operations**



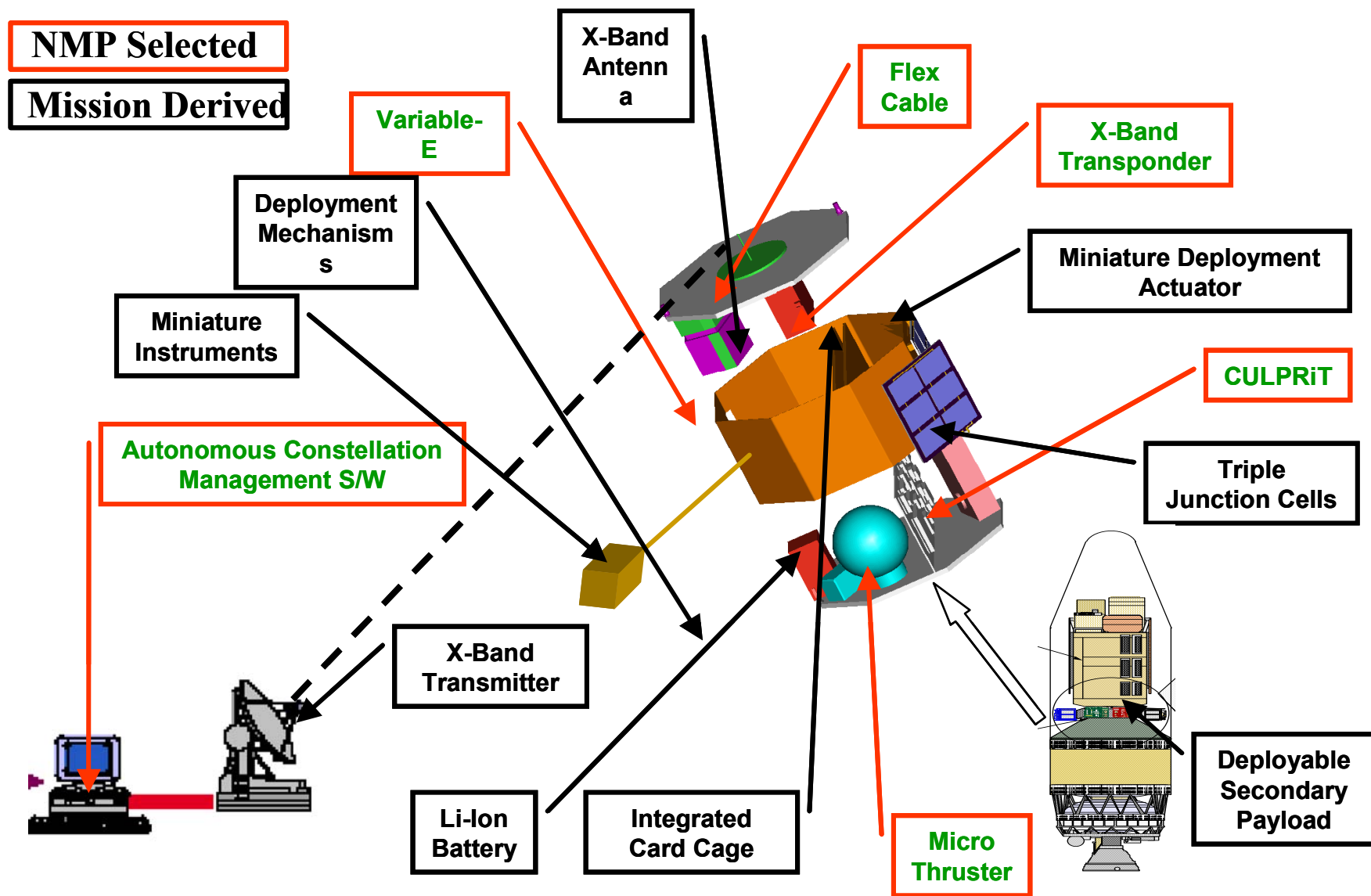
ST-5 Benefits to NASA

- Pathfinder for all missions requiring highly capable, affordable, small spacecraft - whether strategic (e.g., MagCon) or selected competitively through the Explorer, Discovery and Earth Probes Programs;
- Pathfinder for constellation mission operations, autonomy, communications and manufacturability/cost;
- Flight validation vehicle for miniaturized subsystems (e.g., sun sensor, X-Band transponder, micro-thruster, magnetometer, etc.)
- Pathfinder for secondary launches as a means of reducing cost for near-earth scientific spacecraft (e.g., Living With A Star (LWS)).



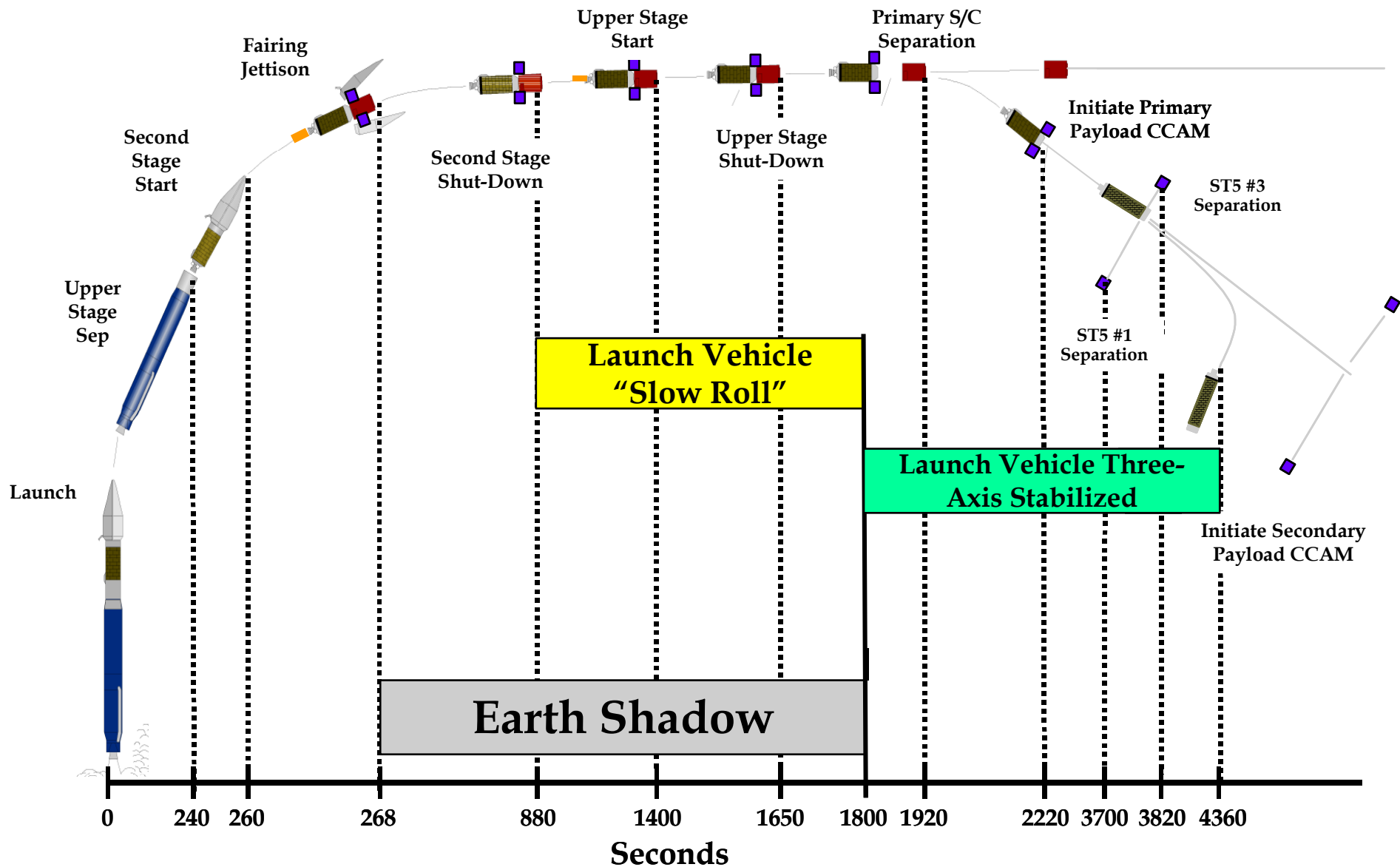
SFC

Technology Development Overview



Launch Sequence

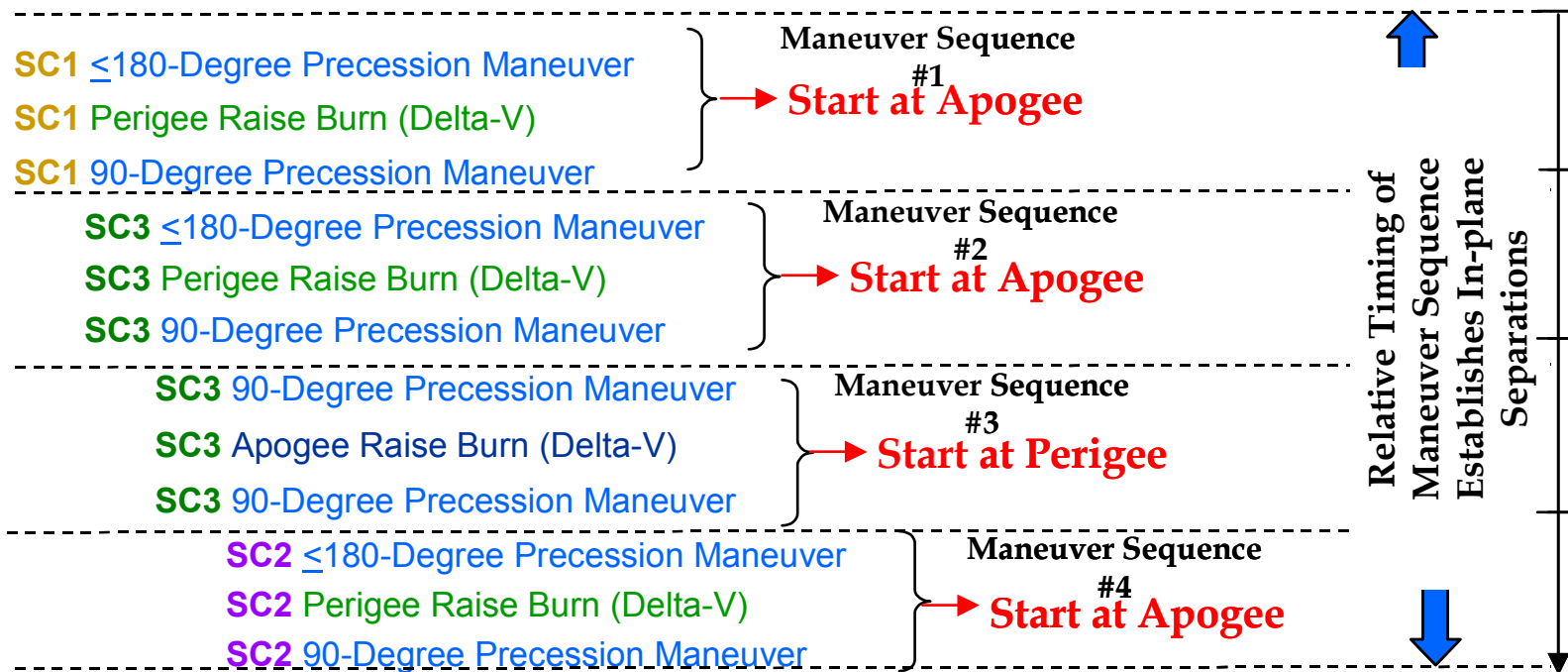
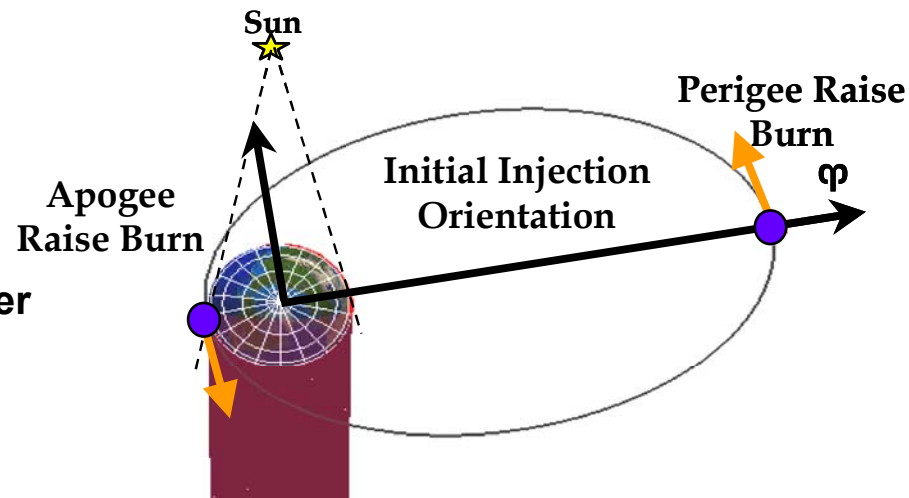
SFC





Early Orbit Operations

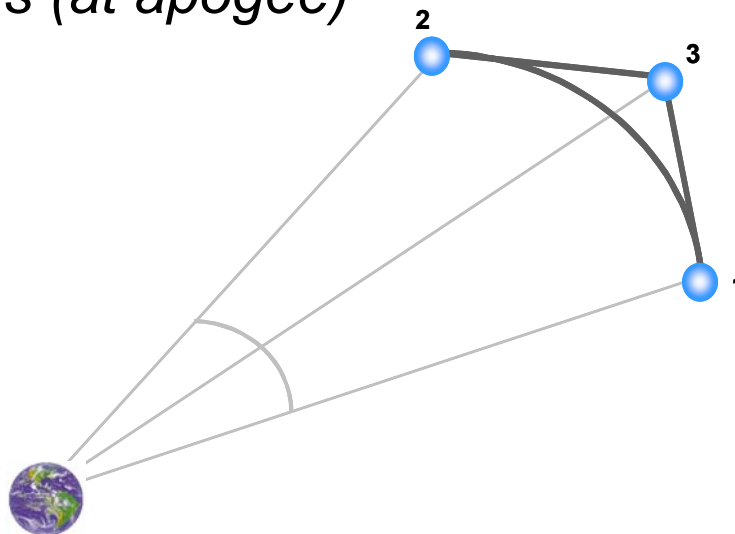
- **Sun Acquisition**
 - Upon Deployment, Autonomous
 - Spin axis to Sun Line within 5 deg
- **Contact, Checkout and Deployments**
 - First Few Orbits (1 - 2 Days)
- **Attitude, Orbit Determination and Maneuver Planning**
 - 2-5 Orbits (3 Days)
- **Establish Constellation Geometry (TBD)**
 - 5-20 Orbits (~10 Days)



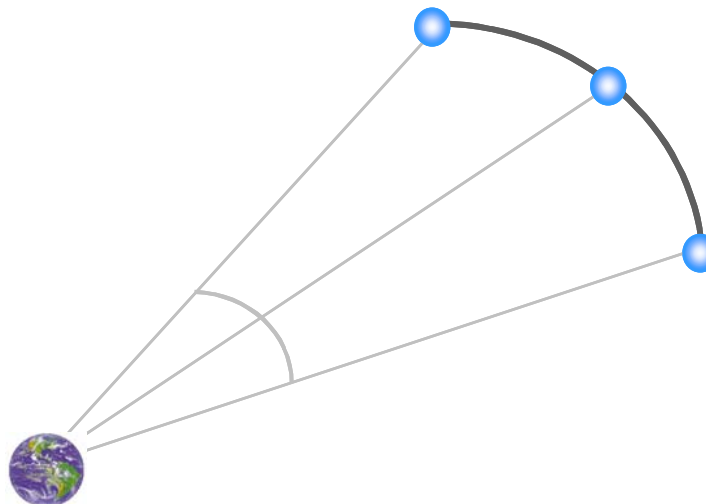
L&EO Requirements

- Orbit configuration options (at apogee)

1 *Triangle:*



2 *String of Pearls:*



Normal Operations

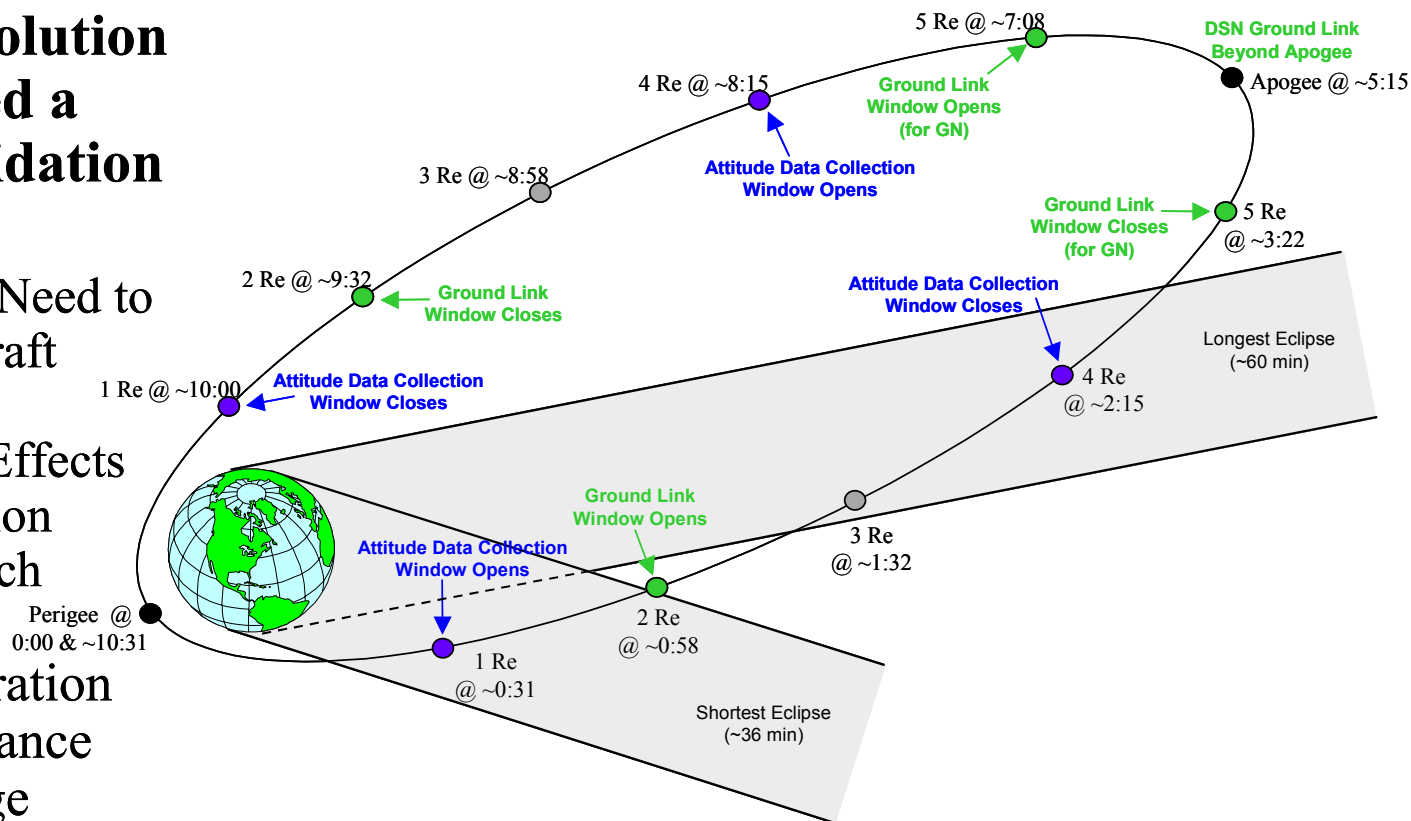
SFC

- Following Launch and Early Orbit Operations
 - ~11 Weeks for Technology/System Validation
 - ~190 Orbital Revolutions to Perform Validation Activities
 - Perform Minimum On-Orbit Validation Activities within First 120 Orbital Revolutions

- **Each orbital revolution will be considered a standalone “Validation Run”**

- Operations will Need to Balance Spacecraft Resources and Environmental Effects Against Validation Activities for each “Run”

- Eclipse Duration
- Energy Balance
- Data Storage





SFC

Full Mission Timeline

L&EO
Phase
* In review

Nominal On-Orbit Validation Phase

Ops Week	1	2	3	4	5	6	7	8	9	10	11	12	13
Thruster	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Flex Cable	Used routinely												
Xponder	Checkout	Used routinely (Optimally once per orbit)											▲
Variable-E Coatings	Checkout	Cycled off as needed for power consideration											
CULPRIT	Checkout	Used routinely											
MAG Science													
SatTrack		Shadow Routine Operations										Lights-Out Dry-Run	Lights-Out Demo
Average Eclipse *	37 min	39 min	41 min	43 min	45 min	47 min	49 min	51 min	53 min	55 min	57 min	59 min	61 min

▲ Indicates initiation via stored command

Minimum Mission Duration
(~38% Margin)

* Average Eclipse (In review)



Mission Operations Requirements



General Requirements

- Highest level requirements governing Mission Operations Support
 - *The system shall support validation of NMP technologies* (MRD 10100000)
 - *Mission will be segmented into distinct phases to ensure S/C are ready to support technology validation, then execute technology validation* (OCD Section 4.4)
 - *The S/C shall be designed for a 3 month mission duration* (MRD 10502000)
 - *Mission phases and operations concepts designed within 3 month constraint* (OCD Section 4)
 - *The GDS shall provide support capabilities for S/C scheduling activities and periodic maneuver planning* (MRD10308011)
 - *Operations concepts include equipment, personnel, and procedures to plan and execute mission operations* (DMR 4.2; OCD Sections 3, 4.1, 4.3, & 4.4)



L&EO Requirements

- The S/C shall be inactive during ascent (MRD 10401010)
- The S/C shall be powered-on upon separation from the deployment structure (MRD 10404020)
 - *Deployment sequence includes S/C power-up and sun acquisition (OCD Section 4.4.2.2)*
- Final orbit shall have a perigee altitude > 185 km, and a geocentric apogee $> 5 R_e$ (MRD 10501000)
 - *Actual perigee will be > 200 km or the orbit will decay too quickly*
 - *Launch vehicle should get us close; maneuver sequences planned throughout L&EO phase to position S/C in final orbit with proper constellation geometry at apogee (OCD Sections 4.4.2.1 & 4.4.2.3)*
 - *Two options under review for final orbit configuration*



Ground System Requirements

ST-5 Ground System Approach

- Heritage systems from MAP, IMAGE and EO-1
 - *Operating system is “ASIST”, same as MAP, IMAGE & EO-1*
 - *ST-5 FSW is MAP heritage, therefore ST-5 data formats are heritage*
 - *Mongoose processor and oscillator are heritage from MAP*
 - *Integration and test system is also ASIST, same as MAP*
- *ST-5 Mission Operations Center wil be located at GSFC*
 - *Possible MOC locations include MAP, IMAGE or EO-1 MOCs*
 - *Data interfaces via NISN*
- *GSFC Flight Dynamics for orbit determination*



Requirements

- The ground segment shall provide one 20-minute contact window per S/C every orbit below 5 R_e altitude (MRD 10801000)
 - *For nominal operations, ground stations required to provide 30 minutes of visibility for simultaneous data command, telemetry, and tracking,*
 - *Extra time added for link acquisition and margin*
 - *5 R_e not applicable to DSN*
 - *Data recovery goal for ground station is 90% (space to ground)*
- The system uplink data rate shall be 1 Kbps.
(MRD 10303061 - supporting)



Requirements

- The S/C shall have 2, ground selectable, downlink data rates: 1 Kbps (2 Ksps) and 100 Kbps (200 Ksps) (MRD 10303063 - supporting)
 - *The S/C shall be capable of supporting the high rate downlink to a communications range of $5 R_e$. – N/A DSN (MRD 10303065 - supporting)*
 - *The S/C shall be able to support the low data rate downlink at any point in the orbit (MRD 10303066 - supporting)*
- The ground station shall be capable of performing Doppler tracking in support of orbit determination (MRD 10301020)
 - *The system radiometric two-way Doppler tracking accuracy shall be sufficient to support ground antenna pointing. (MRD 10301011 - supporting)*
 - *Ground station oscillator must be stable enough to support*
 - *The system shall be capable of supporting the mission using only one-way Doppler measurements from the S/C (10301012 - supporting)*



Requirements

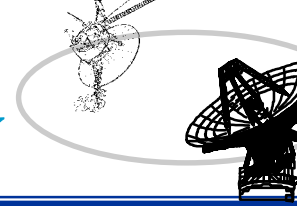
- Ground station-received Automatic Gain Control (AGC) levels in addition to auto-tracking antenna angles shall be provided ([MRD 10104024](#))
 - *Ground stations to provide data each pass in support of transponder performance validation*
- Time correlation between the S/C clock and UTC shall be known to within 5 msec (3 sigma) ([MRD 20500000 - supporting](#))
 - *Telemetry received by the ground network shall be time tagged to an accuracy of at least 1 msec (3 sigma) of UTC* ([MRD 20504000](#))

Ground System Milestones

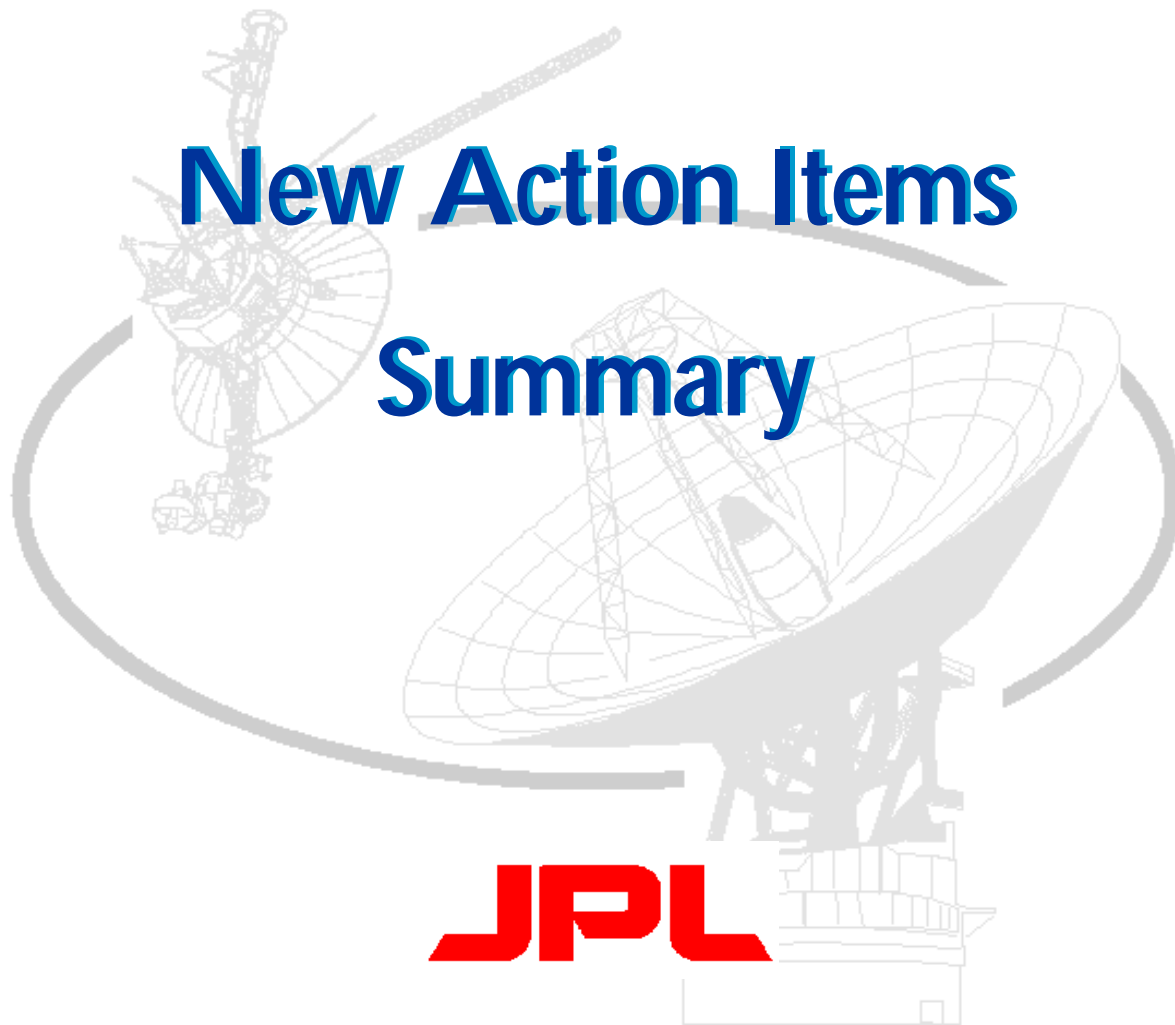


Ground Network Tests

TIME	ID	TEST TITLE	RESOURCES		TEST OBJECTIVES	NOTES
L-10 mos	CT-2	RF Compatibility Test #2	ST-1 at station site or with		GSE (ie Van) to verify compatibility	
L-9 mos	NT-1	TT&C Ground Station Tests	MOC, Gnd Stations, NISN	Predecessor to SIM group #3	Verify TT&C interfaces with each gnd station.	Separate test for each ground station. Use recorded data from FLATSAT or ST-1 Spacecraft.
L-8mos	MRT-7	Mission Planning and Scheduling Test	FLATSAT, HDS, MOC, Gnd Stations, NISN, FDF	Predecessor to SIM group #3	Verify all interfaces to MPSS and complete MPSS functionality.	Load RTCS and ATCS files to RAM and execute.
L-8mos	MRT-8	SatTrack Lights-out Test	FLATSAT, HDS, MOC, Gnd Stations, NISN, FDF	Predecessor to SIM group #3	Verify all interfaces to SatTrack and its functionality.	
L-7mos	CT-3	RF Compatibility Test #3	ST-2, ST-3, CTV	Pre-TV	Verify compatibility of ground stations, satellites.	
L-6mos	NT-2	Comprehensive Ground Station Tests	MOC, Gnd Stations, NISN, FDF		Verify cmd & tlm data flow and exchange of schedules, acquisition data, and tracking data with each ground station.	Separate test for each ground station. Use recorded data from FLATSAT or ST-1 Spacecraft.
L-5mos	NT-3	Fully Integrated Ground Segment Test	MOC, Gnd Stations, NISN		Verify changes in ground segment since last fully integrated test (resolution of discrepancies found in NT-2) and readiness of network to support ST-5 operations.	Use recorded data from FLATSAT or ST-1 Spacecraft.
L-3mos	CT-4	Cmd & Tlm Test (End-to-end, if Ground Station GSE included)	ST-1, ST-2, ST-3, MOC, NISN, PTP, Gnd Stat GSE? Others??	Pre-ship	Cmd & Tlm interface compatibility between MOC and all spacecraft at all rates and modes. Final validation of all nominal operations & contingency STOL procs, cmd & tlm databases, ATCS/RTCS generation & execution, time correlation.	Uses X-Band RF link to MOC via fiber link to Bldg 25, then use PTP for link to MOC.



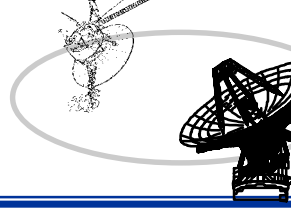
New Action Items Summary



JPL

Gene Burke

RESOURCE ALLOCATION REVIEW



Resource Allocation Review 2003 - 2012

TIMELINE FOR NEXT REVIEW August 13, 2002

<u>Calendar Date</u>	<u>Milestones</u>
May 7, 2002	Distribute Mission Set, Major Events and User Loading Profiles to Projects/Users for verification.
May 28, 2002	Deadline for Projects/Users response to Mission Set, Major Events and Users Loading Profiles and Last day for trajectory or viewperiod updates or submissions.
July 16, 2002	Publish preliminary Contentions and Recommendations on the RAPWEB for Projects/Users review
July 18, 2002	NASA Headquarters Science Review
July 23, 2002	Review RAPWEB published contentions with Projects/Users
August 13, 2002	Resource Allocation Review

Action Item Summary from Feb 12, 2002 RARB - D. Morris

#	Year	Month	System	Responsible	Due	Status	Action
1	2004	January	MER	J. Erickson	6/1/2002	Open	Provide Final Landing Site coordinates (SPK file) for both Rovers one year prior to launch. (Reference A.I. #7 of August 13, 2001 RARB)
2	2003	January - December	DSMS Plans & Commit.	R. Miller	4/22/2002	Open	Investigate and Negotiate the feasibility of alternate assets providing current DSN Catalog Maintenance and Enhancement (CAT M&E) radio sources.
3	2003	January - December	SGP	N. Lacey/ P. Wolken	4/1/2002	Closed 4/16/02	As a result of recommending deletion of the entire 2003 request of Space Geodesy Program, provide a listing of opportunities to the project to assist in their re-planning a reduced (hours) experiment.
4	2003	January	SIRTF	P. Beyer	4/18/2002	Closed 4/4/02	Perform telecom analysis to determine the adequacy of DSS-63 supporting spacecraft on day of launch. The expressed concern is that the DSS-63 X-band transmitter may saturate the SIRTF receiver. (DSS-65 has Downtime; DSS-54 is supporting Cassini GWE.)
5	2003	January - April	DSN	M. Wert	4/19/2002	Closed 4/10/02	Investigate the impact to operations from deleting or reducing the 70m Antenna Calibrations in this period.
6	2003	November	MER-A Odyssey	J. Erickson	4/18/2002	Open	MER-A agreed to modify DSN requests for Odyssey and MGS to fulfill required support in weeks 46-47 of November 2003.
7	2003-2004	December -February	Mars Program	C. Whetsel	5/1/2002	Open	Mars Program will evaluate support problems during the mid-December 2003 through end of February 2004 timeframe. All NASA and non-NASA Mars missions requirements will be evaluated and coordinated in light of the NASA Mars mission priorities and provided in time to be addressed at the August 2002 RARB.
8	2004	January	Cassini	B. Mitchell	4/18/2002	Open	Cassini, based upon the recommendations of taking daily 1-4 hour gaps during the Canberra/Madrid overlap in January 2004, will evaluate impact to GWE. In addition, evaluate sliding the entire 40 days for the GWE earlier by a few weeks.
9	2004	January	MER-B	J. Erickson	4/18/2002	Open	Mars Exploration Rover Project will evaluate whether MER-B can reduce coverage during critical MER-A TCMs (4, 5 and 6) in order that the support is used for a MER-A required hot-backup 34m antenna.
10	2004	January	DSN	C. Jacobs	4/18/2002	Open	Provide analysis of impact (e.g., to MER-B landing accuracy) of moving DSN Clock Sync VLBI out to week 4.
11	2004	January	MER	J. Ludwinski	2/26/2002	Closed 3/8/02	Provide MER Project Surface Operations Viewperiods for the four primary and two alternate landing sites to RAPSO (J. Kehrbaum).
12	2003-2004	November -February	DSMS Plans & Commit.	R. Miller	5/1/2002	Open	Identify Risk Posture for individual mission's key events to plan steps the DSN can do to mitigate foreseeable anomalies (e.g., station outages, s/c emergency, MCD3 contention, etc.).

February 12, 2002 RARB Contention Resolution Minutes

2003 Contention Period - January - Weeks 01 - 05

During the GWE in Weeks 01 to 03, Cassini agreed to use 12 hours at DSS-25, 8 hours at DSS-54, and 4 hours at DSS-45, to help resolve moderate contention in these weeks. Cassini commented that during the GWE support, it has a 10-degree elevation, and a requirement for 2-way support.

DSN agreed to reduce Antenna Cals from 8 hours to 4 hours in Week 01 through Week 03. DSN agreed to delete CAT M&E D-M4 24-hour support at DSS-15\45 in Week 02.

Note: C. Jacobs made a strong argument against reducing CAT M&E and Clock Sync activities stating that two Clock Sync supports per month are needed to meet essential Delta DOR requirements in 2003. *Action Item (AI) #10* was assigned to C. Jacob, to evaluate the magnitude of error caused when Clock Sync supports are scheduled at intervals of less than 2 tracks per month. In addition, Rich Miller was assigned *AI #2* to investigate the availability of using alternate antenna assets for conducting Catalog M&E and Clock Sync supports.

Ground-Based Radio Astronomy (GBRA) agreed to delete DSS-14\63 VLBA SOC-M4 in Week 01; GBRA agreed to reduce DSS-45 Host Country support to 8 hours in Week 02; GBRA agreed to delete DSS-63 Host Country support in Week 03; GBRA agreed to reduce Planet R/Astronomy and M-Wave Spect from 9 hours to 4 hours in weeks 01 through 05; GBRA agreed to delete DSS-63 RA360 H20 in weeks 01 through 05, and to delete DSS-14\63 RA500 SOC-M4 in Week 05.

Galileo agreed to change support to five 8-hour and two 6-hour passes at DSS-14, and seven 7-hour passes at DSS-63 in Week 01. Galileo agreed to change support to four 7-hour and three 5-hour passes at DSS-14, and to change support to one 10-hour, two 7-hour and three 5-hour passes at DSS-63 in Week 02. Galileo did not agree to receive requested support using DSS-14 in Week 03. However, after discussions, Galileo agreed to accept two 8-hour passes at DSS-63 and three 8-hour passes at DSS-14.

Mars Odyssey agreed to accommodate Galileo's end of routine support in Week 03 on DOY 015 by reducing support this month at DSS-63 and 14, Monday through Wednesday and increasing support Thursday through Sunday. Mars Odyssey agreed to change to five 7-hour and one 4-hour passes at DSS-14, and six 8-hour and one 4-hour pass at DSS-63 in Week 01, to accommodate DSS Maintenance. In addition, Mars Odyssey agreed to reduce support at DSS-63 Monday through Wednesday for Galileo, and to increase support Friday through Sunday at DSS-63 in Week 03.

Mars Global Surveyor agreed to change 6 of 14 passes from the 34HEF to MSPA with Mars Odyssey at DSS-63, and to use DSS-15 and DSS-45 to support the remaining 8 Mars Global Surveyor passes.

MEGA agreed to delete support in Weeks 02 to 04.

Space Geodesy Program (SGP) did not accept the recommendation to delete all support in Weeks 01 to 05. Nap Lacey was assigned *AI # 3* to work with P. Wolken and G. Martinez, to reduce support or replan coverage.

SIRTF agreed to change continuous support in Weeks 02 – 03 DOY 014 from DSS-25, 34, and 54 to DSS-15, 34, and 63. SIRTF agreed to change continuous support in Week 03 (DOY 015) from DSS-25, 34, and 54 to DSS-25, 34, and 63. SIRTF also agreed to change continuous support in Weeks 04 - 05 from DSS-25, 34, and 54 to DSS-25, 34, and 54.

Pat Beyer raised a concern regarding the use of the 20kW transmitter at DSS-63 potentially saturating the spacecraft receiver. *Action Item #4* is assigned to Pat Beyer to investigate the use of the 20kW transmitter at DSS-63 for the uplink, and to perform a link analysis to determine its impact.

SOHO HSO agreed to requested support on best efforts basis and will accept incurring gaps in HSO continuous support.

Ulysses agreed to move all support to DSS-14, DSS-15, and DSS-24 using two 5-hour split passes per day as required.

Voyager 1 agreed to requested support using DSS-15 and DSS-25.

2003 Contention Period - February - Weeks 06 - 09

Chandra agreed to move nine 2-hour passes to the 26m.

DSN did not accept the recommendation to delete Antenna Calibration in Weeks 06, 07 and 09. *Action Item # 5* was assigned to Mike Wert to investigate impact of reducing Antenna Calibration supports. Note: N. Lacey later changed the deletions of Antenna Calibration to 4-hour reductions.

DSS agreed to move DSS-24 maintenance support to Tuesday.

GBRA agreed to reduce DSS-63 M-Wave Spect, Planet R/Astronomy, and RA360 H20 MSR supports to 4 hours. GBRA agreed to delete VLBA SOC-M4 at DSS14\63 in Week 06.

GSSR agreed to reduce Orbital Debris at DSS-14/15 to 4 hours in Weeks 07 and 09.

Mars Global Surveyor agreed to MSPA 7 passes at DSS-14 and 63 in Week 06 and 08, and to MSPA three passes at DSS-43 in Weeks 07 and 09 with Mars Odyssey. MGS will still attempt to meet its requirement of 12 hours of contiguous support. In addition, Mars Global Surveyor agreed to accommodate Voyager 1 MAGROL in Week 06.

Mars Odyssey agreed to MSPA 7 passes at DSS-14 and 63 in Week 06 and 08, and to MSPA 3 passes at DSS-43 in Week 07 and 09 with Mars Global Surveyor. In addition, Mars Odyssey agreed to accommodate Voyager 1 MAGROL in Week 06.

MEGA agreed to delete support in Week 07 and 08.

SOHO HSO agreed to requested support on best efforts basis and will accept incurring gaps in the HSO continuous support.

SIRTF agreed to use 7 passes at DSS-25, and to use 14 passes at DSS-34, 45, 54, and 63 in Week 06. In addition, SIRTF agreed to use DSS-15, 45, and 54 in Weeks 07 to 09.

Ulysses agreed to move all support to DSS-14, 15, and 24 using two 5-hour split passes per day as required.

Voyager 2 agreed to move routine support from DSS-43 to DSS-34 and DSS-45 in Weeks 07 to 09.

2003 Contention Period - March - Weeks 10 - 13

Cassini agreed to reduce support to 8 hours and use DSS-45 only.

DSN did not accept the recommendation to delete Antenna Cals in Week 10 and 11. See *AI # 5*. Note: N. Lacey later changed the deletions of Antenna Calibration to 4- hour reductions.

GBRA agreed to delete DSS-45 Host Country support in Week 13.

MEGA agreed to delete support in Weeks 10, 11 and 12.

Mars Global Surveyor agreed to change Mapping/Beta supplement passes to MSPA with Mars Odyssey at DSS-14, 43, 45, and 65. In addition, Mars Global Surveyor agreed to accommodate Voyager 1 ASCAL, MAGROL, and DTR P/B.

Mars Odyssey agreed to MSPA with Mars Global Surveyor and accommodate DSS Routine and Bearing Maintenance by planning short passes on maintenance days and long passes on non-maintenance days. In addition, Mars Global Surveyor agreed to accommodate Voyager 1 ASCAL, MAGROL, and DTR P/B.

SGP did not accept the recommendation to delete Crust Dyn at DSS-45 in Week 10, and to delete Crust Dyn at DSS-65 in Week 11. Reference *AI # 3*.

SOHO agreed to delete TSO support and restore routine coverage in Week 13. In addition, SOHO agreed to accommodate 26m DSS Maintenance.

Ulysses agreed to move all support to DSS-14 and DSS-24 using two 5-hour split passes per day as required.

Voyager 1 agreed to reduce DSS-14 negotiated passes to 4 hours in Week 10.

2003 Contention Period - April - Weeks 14 - 17

Cassini agreed to use DSS-45 and reduce support to 8-hours in Week 14 and 15.

Cluster 2 agreed to exclude use of DSS-46 in Weeks 15 through 17.

DSN did not accept the recommendation to delete Antenna Calibration in Week 14 and 15. *Refer to AI # 5*. N. Lacey later changed the deletions of Antenna Calibration to 4-hour reductions.

DSS agreed to move DSS-24 Maintenance to Tuesday in Week 16 and delete DSS-46 Maintenance in Weeks 15 to 17.

GBRA agreed to delete DSS-43 and DSS-63 Host Country 24-hour support in Week 16 and 17, and to delete M-Wave Spect & Planet R/Ast in Weeks 14 to 16.

Geotail agreed to exclude use of DSS-46 in Weeks 15 to 17.

GSSR Mercury agreed to reduce support to 4 hours.

Mars Global Surveyor agreed to change Mapping/Beta supplement passes at DSS-65 to 7 hours & MSPA with Mars Odyssey at DSS-14, 43, 45, and 65 in week 14 only.

Mars Odyssey agreed to change passes to MSPA with Mars Global Surveyor at DSS-14, 43, 45, and 65 in week 14 only.

MEGA agreed to delete support in Weeks 14 to 16.

Polar agreed to exclude use of DSS-46 in Weeks 15 to 17.

SGP did not accept the recommendation to delete DSS-65 Crust Dyn B-M4 24 hour support in Week 14, and to delete DSS-45 Crust Dyn W-M4 18-hour support in Week 15 and 16. Refer to *AI # 3*.

SOHO agreed to exclude use of DSS-46 beginning Week 15. SOHO did not accept the recommendation to delete TSO support in Week 17, but agreed to keep support on a best effort basis while incurring gaps.

Ulysses agreed to move all support to DSS-14 and 24 using two 5-hour split passes per day as required.

Voyager 1 agreed to delete routine support at DSS-14 and 45 in Week 14. Voyager 1 agreed to delete routine support at DSS-14, 43 in week 15 and 16, and to delete DSS-14 and DSS-63 support in Week 17. In addition, Voyager 1 agreed to use planned 8-hour passes at DSS-26. Note: Voyager 1 acceptance of DSS-26 support is contingent upon DSS-26 availability, and if support cannot be met at DSS-26 Voyager 1 will receive support by an alternate DSN antenna.

2003 Contention Period - May - Weeks 18 - 22

The proposed DSS-46 servo hydraulic drive replacement downtime in Week 18 was approved. To support the downtime effort DSS Maintenance agreed to reduce DSS-16 and DSS-27 maintenance to 6 hours each in Weeks 18 through 20.

Geotail agreed to move support in Week 18 from DSS-46 to DSS-16, 27, and 66 to accommodate DSS-46 servo hydraulic drive replacement downtime.

Polar agreed to move 7 real-time and 7 playback passes from DSS-46 to DSS-16, 27 and 66 and to move 11 playback passes to the 34B1 in Week 18. In addition, Polar agreed to move 11 playback passes to the 34B1 in Week 19 and 20 to accommodate DSS-46 servo hydraulic drive replacement downtime.

SOHO agreed to reduce the 9.6-hour passes to 6 hours each and to schedule three 1-hour ranging passes using the 34B1 in Weeks 18 through 20. In addition, SOHO agreed to move the reduced 6-hour passes in Week 18 to DSS-16, 66 and the 1.6-hour passes to DSS-16, 27 and 66 to accommodate DSS-46 servo hydraulic drive replacement downtime.

WIND agreed to reduce three 5-hour passes at 34B1 to 4 hours each in Weeks 18 through 20.

2003 Contention Period - June - Weeks 23 - 26

DSS Maintenance agreed to move DSS-24 maintenance in Week 24 to Tuesday to accommodate the Genesis maneuver on DOY 161.

Mars Global Surveyor agreed to delete four 12-hour passes on the 34HEF in Week 26 and to MSPA 4 additional 7-hour passes with Mars Odyssey at DSS-25, 34, and 54 to resolve contention with MER-A/B and Mars Odyssey.

Mars Odyssey agreed to reduce the number of stand-alone passes at DSS-25, 34, 54 from 11 to 7 and to MSPA 4 additional passes with Mars Global Surveyor.

2003 Contention Period - July - Weeks 27 - 31

GBRA agreed to move DSS-45 Host Country support from Week 29 to Week 30.

Goldstone Solar System Radar did not accept the recommendation to reduce the Mars observations in Week 30 to 3-4 hours and to delete the observation in Week 31. Goldstone Solar System Radar stated that the observations are dependent on the Mars Exploration Rover landing site selections and that GSSR will work internally with the Mars Program Office under AI # 7 to resolve contention in these weeks.

Voyager 2 agreed to reduce two DSS-45 passes in Week 29 to 5 hours and to support the remaining 5 passes at DSS-43.

2003 Contention Period - August - Weeks 32 - 35

Goldstone Solar System Radar did not accept the recommendation to delete the Mars observation in Week 33 and stated the observation is dependent on the Mars Exploration Rover landing site selections. Contention between the Goldstone Solar System Radar Mars and Asteroid 1994PM observations at DSS-14 on DOY 225 and with Mars Odyssey support at DSS-25 will be resolved with the Mars Program Office under AI # 7.

Mars Global Surveyor agreed to move 9-10 MSPA passes with Mars Odyssey from DSS-24, 34, 63 and DSS-25, 34, 63 to DSS-24, 25, 34 to Week 32 and 33. Mars Global Surveyor agreed to reduce three DSS-63 passes to 7 hours and to MSPA with Mars Odyssey using DSS-63 in Week 35. In addition, Mars Global Surveyor agreed to support the remaining 7 stand-alone passes at DSS-25, and 34.

Mars Odyssey agreed to move 9-10 MSPA passes in Week 32 and 33 from DSS-24, 34, 63 and DSS-25, 34, 63 to DSS-24, 25, 34. In addition, Mars Odyssey agreed to MSPA 3 DSS-63 passes with Mars Global Surveyor in Week 35.

MER-A agreed to move 4 cruise passes in Week 32 from the 34HEF to DSS-25, and 43 to resolve contention between MER-A and MER-B on the 34HEF.

MER-B agreed to move five 34HEF checkout passes in Week 32 to the 70m and to Delete the DSS-15\45, 15\65 1-hour VLBI request and include VLBI support into the overlap between 2 checkout passes. MER-B agreed to move 3 cruise passes in Week 33 to DSS-24, 25, and 34 and to modify the Cruise/VLBI request to use DSS-14, 15, 24, 25 for the 9-hour passes and DSS-45, 43, 65, and 63 for the 8-hour passes.

2003 Contention Period - September - Weeks 36 - 39

Goldstone Solar System Radar did not accept the recommendation to reduce the Mars observation on DOY 245 to 3 hours to resolve contention with the Mars Exploration Rover B EDL test. Goldstone solar system radar stated that the observation is dependent on the Mars Exploration Rover landing site selections and that GSSR will work internally with the Mars Program Office to resolve contention under AI #7.

MER-A agreed to move 3 cruise passes in Week 36 and 37 to 34B1 antennas.

Mars Global Surveyor agreed to MSPA 9-10 passes with Mars Odyssey in Weeks 36 to 38 using DSS-43 and DSS-63 while reducing MSPA pass duration to 7 hours. In addition, Mars Global Surveyor agreed to schedule nine to ten 4-hour passes at the 34B1.

Mars Odyssey agreed to MSPA 9-10 passes in Weeks 36 to 38 with Mars Global Surveyor at DSS-43 and 63.

Nozomi agreed to move Week 38 support from DSS-43 or 34 to DSS-34 only.

2003 Contention Period - October - Weeks 40 - 44

October was not addressed at the RARB. Analysis showed that user contention and unsupportable time was within workable levels and contention should resolve during final schedule preparations and negotiations.

2003 Contention Period - November - Weeks 45 - 48

ACE agreed to move 4-5 passes to DSS-46 and 66 in Weeks 45 through 47 to resolve contention with 26-meter users.

Goldstone Solar System Radar agreed to delete the Asteroid 1996GT observation in Week 46 to resolve contention with the Mars Exploration Rover B EDL test on DOY 317.

Mars Express agreed to move all support in Week 47 to DSS-55 using three 8-hour and four 9.9-hour passes at DSS-55 to resolve contention with other Mars viewperiod users on the 70m and 34m subnets.

Mars Global Surveyor did not accept the recommendation to reduce from eight 10-hour passes to seven 4-hour MSPA passes with Mars Odyssey in Week 47 and to schedule seven 4-hour stand-alone passes using DSS-25, 26, 55. The Mars Program Office accepted an action under AI # 6 to investigate and provide a resolution.

Mars Odyssey did not accept the recommendation to use 4 passes at DSS-63 and to receive the remaining support using DSS-14, and 43 in Week 46. Mars Odyssey did not accept the recommendation to reduce from eight 10-hour passes to seven 4-hour MSPA passes with Mars Global Surveyor and seven 4-hour stand-alone passes in Week 47. The Mars Program Office accepted an action under AI # 6 to investigate and provide a resolution.

MER-B agreed to move four TCM passes from the 34H to 70m antennas in Week 47.

Nozomi agreed to use DSS-34 for two routine passes in Week 47.

Voyager 1 agreed to delete support at DSS-43, 54 in Weeks 47 and 48 using the seven 8-hour passes planned at DSS-26 for support.

Voyager 2 agreed to reduce three DSS-34 passes in Week 47 to 4 hours and to move support to DSS-43 and 45.

2003 Contention Period - December - Weeks 49 - 52

DSS Maintenance agreed to reduce DSS-16 and DSS-66 support to 6 hours in Weeks 50 and 51. DSS Maintenance did not accept the recommendation to adjust maintenance requests for support in the RAP database to match the DSN maintenance holiday schedule. Week 52 maintenance at DSS-15, 24, 45, 54, and 55 shall remain in the plan as requested.

Gravity Probe B agreed to move Week 51 support to Week 49.

Mars Global Surveyor, Mars Odyssey and Nozomi did not accept the recommendations in Weeks 50 through 52. The Mars Program Office will work internally under *AI # 6* to investigate and provide a contention resolution for this period.

MER-B agreed to move 4 approach/VLBI passes from the 34B1 to 70m antennas; two 8-hour passes to DSS-43 and 63 and two 9-hour passes to DSS-14. MER-B also agreed to move two approach passes from DSS-15 to DSS-14 in Week 52.

SOHO agreed to reduce three 9.6-hour passes to 6-hours each in Weeks 50 through 52.

Voyager 2 agreed to reduce two 5-hour passes at DSS-34 in Weeks 49 and 51.

2004 Contention Period - January - Weeks 01 - 05

Cassini did not accept the recommendation to reduce DSS-45 support to 4-hours, to increase DSS-25 8-hour supports to full view (10-12 hrs), and to reduce DSS-65 8-hour supports to 6-7 hours in Weeks 01 to 04, and did not accept incurring daily gaps of 1-4 hours at the Canberra/Madrid overlap. This was to accommodate MER-A/B and Deep Impact during Cassini's Gravity Wave Experiment (GWE) continuous support at DSS-25, 45, and 65. Cassini Project Manager (R. Mitchell) stated that incurring gaps in the GWE data during the December 2003 through January 2004 time frame is not accepted and he will investigate the possibility of moving the GWE earlier by 4-8 weeks, into the November 2003 time frame, or moving the GWE later into the February 2004 time frame.

Cluster 2 agreed to delete DSS-15 and 45 from SSO Array supports in Weeks 02-05 to accommodate MER-A/B Approach, VLBI, EDL, and Surface Ops.

Deep Impact agreed to reduce DSS-15 supports from 8 hours to 4 hours and to increase pass duration to full view (10-12 hours) at DSS-34 and 54 in Week 01. Deep Impact agreed to use DSS-24 instead of DSS-15, and to use split passes of 4 - 5 hours at DSS-54 and 55 in Weeks 02 to 04, to maintain continuous coverage. Deep Impact agreed to requested support at DSS-34 to accommodate Cassini GWE and the Mars Projects busy period for Approach, VLBI, EDL, and Surface Ops and for Stardust Comet P/Wild 2 Encounter and Playback.

DSN Antenna Calibration agreed to delete support in Week 01 and to reduce support from 8 hours to 4 hours in Weeks 02, 03, and 05. The recommendation is to reduce contention on the 70m and 34HEF during the Mars Projects busy period for Approach, EDL, and Surface Ops

DSN Clock Sync VLBI agreed to move support from Week 02 to Week 04 to reduce contention on the 70m and 34HEF during the Mars Projects busy period for Approach, EDL, and Surface Ops. *Action Item # 4* is assigned to M. Wert to assess the impact of moving, reducing, and deletion of Clock Sync VLBI Calibrations to the source catalogue in support of MER-A/B Delta DOR Campaign.

Ground Base Radio Astronomy (GBRA) agreed to schedule the 24-hour Host Country at DSS-43 in three 8-hour increments and to move support to Week 05. M-Wave Spect agreed to delete support in Week 01 and 02, to reduce three 6 to 9-hour supports to 4 hours in Week 03 and 04, and to reduce three 6-hour supports to two 4-hour passes in Week 05.

Planet R/Ast agreed to delete support in Week 01 and 02, and to reduce Weeks 04 and 05 supports to 4 hours (Week 03 is 4 hours), to help reduce contention on the 70m during the Mars Projects busy period for Approach, VLBI, EDL, and Surface Ops.

Gravity Probe B agreed to move support from Week 01 to Week 05 to reduce contention on the 70m during the Mars Project busy period for Approach, VLBI, EDL and Surface Operations Gravity.

Goldstone Solar System Radar agreed to reduce two 8-hour Asteroid Minos supports to 5 hours in Week 05, and to reduce Mercury observation support from 6 hours to 4 hours in Week 02. The recommendation is to reduce contention on the 70m during the Mars Project busy period for Approach, VLBI, EDL and Surface Operations Gravity.

MAP agreed to move all supports to DSS-43 and 63 in Weeks 02 to 05, to reduce contention at DSS-14 during the Mars Projects busy period for Approach, VLBI, EDL, Surface Operations and Stardust Comet P/Wild 2 Encounter and Playback.

Mars Odyssey did not accept the recommendations for reduction of support in weeks 01 to 05. *Action Item # 7* is assigned to the Mars Program Office, Charles Whetsel to work internally with MER-A/B to secure coverage for Mars Odyssey in Week 02 and to investigate the feasibility of using 34M MSPA supports with Mars Global Surveyor in Weeks 03 to 04, to determine the landing sites for MER-A/B and to evaluate/determine MSPA and stand-alone support for Mars Odyssey. *Action Item # 6* is assigned to MER-A/B (J. Erickson) to workout support strategy to accommodate Mars Odyssey in Week 01.

MER-A accepted the recommendation for Approach/VLBI passes in Week 01 to use 10-hour supports at DSS-14, reduce 8-hour DSS-43 and DSS-63 supports to 7 hours, and to delete requests for 34HEF. MER-A accepted the recommendation to reduce one 70m 8-hour MER-A/Mars Odyssey MSPA support to 5 hours in Week 05. MER-A did not accept the recommendation to delete the requirement for 34HEF hot-backup coverage for TCMs (two passes) in Week 01. *Action Item # 9* was assigned to MER-A to assess the possibility of releasing the 34HEF hot-back coverage requirement. MER-A did not accept the recommendation to MSPA with Mars Odyssey and to accommodate DSS Maintenance by reducing one DSS-14 support by 5 hours, one DSS-43 support by 3 hours, and one DSS-63 support by 4 hours in Week 04, citing the landing sites have not been determined. The Mars Program Office (Charles Whetsel) accepted *AI # 7* to work the contentions in the December 2003 through February 2004 time frame internally with the other Mars Projects to ensure that all Mars Missions have sufficient coverage and to determine the MER-A/B landing sites.

MER-B agreed to move DSS-15 Approach and Approach/VLBI support to DSS-26 in Week 01 to accommodate MER-A and Cassini on the 34HEF. MER-B agreed to use DSS-15 and DSS-26 for Approach and Approach/VLBI support in Week 02. MER-B agreed to use DSS-15, 26 for Approach and Approach/VLBI support in Week 03, but placed emphasis on maintaining its hard requirement for one 70m pass per day.

Mars Odyssey and MER-A did not accept recommendation in Week 04 and accepted an action under *AI # 6* to investigate the Mars Odyssey/MER-A contention and provide resolution for the December 2003 through February 2004 time period. Mars Global Surveyor did not accept the recommendation in Week 02 for the 34B1 TCM support to use 4-hour split passes, delete stand-alone Mapping support on the 34B2, and to use four planned MSPA supports with Mars Express on DSS-26, 55. The Mars Project Office accepted an action under *AI # 6* to investigate contention and provide resolution. Mars Global Surveyor did not accept the recommendation in Week 04 to delete two DSS-26 stand-alone Mapping supports; use 4 planned MSPA supports with Mars Express and to use three 4-5 hour split passes at DSS-34, 45. The Mars Project Office accepted an action under *AI # 7* to investigate contention and provide resolution.

Mars Global Surveyor agreed to use four 5-hour split passes at DSS-26 and 55 for TCM support in Week 03 and for Mapping support in Week 05.

POLAR agreed to move four 26m Real Time (R/T) passes and four 26m Playback (P/B) passes to DSS-27.

SOHO agreed to move four 6-hour 26m supports to DSS-27.

Stardust accepted the recommendation in Week 01 and agreed to increase six 8-hour supports to 9 hours and to use DSS-43; agreed to reduce six 8-hour passes to 6 hours at DSS-14, and DSS-63; agreed to retain one 8-hour pass at DSS-14; agreed to retain planned 4-hour supports at DSS-14 and at DSS-63 to accommodate MER-A and Mars Odyssey on the 70m. Stardust agreed to requested support in Week 02 and 03 and will use full view (10 - 12 hours) at DSS-43 and 7-hour supports at DSS-14 and DSS-63.

Ulysses agreed to change seven 10-hour passes to (14) fourteen 5-hour split passes using DSS-24, 15, and 34 in week 01 to accommodate Wind. Ulysses agreed to change four 10-hour passes to eight 5-hour split passes at DSS-54 and 24 in Week 02 to accommodate WIND. Ulysses agreed to reduce continuous support to 16 hours U/L and D/L per day in week 04 and 05. Ulysses stated it would like to maintain continuous coverage on a best effort basis incurring gaps.

Voyager 2 agreed to change all supports to two 4-hour split passes per day (fourteen 4-hour passes per Week) at DSS-43, 45, and 34.

WIND agreed to move the TCM support from Weeks 01 and 02 to Weeks 05 and 06 and to reduce routine support to 4 hours each to accommodate Genesis routine and Maneuver support and Ulysses.

2004 Contention Period - February - Weeks 06 - 09

DSN Cat M&E agreed to use two split supports of 12-hour increments each for Cat M & E in week 06 during the MER-A and MER-B high activity period.

DSS Maintenance agreed to reduce one routine 8-hour support at DSS-14 to 6 hours in Week 09 to accommodate Mars Odyssey stand-alone, Mars Odyssey/MER-A and Mars Odyssey/MER-B MSPA supports on the 70m.

EVN agreed to requested support using three 8-hour supports in Week 09 during the MER-A and MER-B high activity period.

Ground Base Radio Astronomy Host Country agreed to change support to two 8-hour supports to reduce contention during the MER-A and MER-B high activity period.

RA500 agreed to requested support using three 8-hour increments to reduce contention during the MER-A and MER-B high activity period.

M-Wave Spect agreed to delete support in Week 06, and to reduce support to 4 hours using DSS-43 in Weeks 07 through 09 to reduce contention during the MER-A and MER-B high activity period.

Planet R/AST agreed to delete support in Week 06 and 09 and reduce support to 4 hours in Week 07 and 08, to reduce contention during the MER-A and MER-B high activity period.

Goldstone Solar System Radar Asteroid Minos agreed to move one 5-hour support to Week 05, to reduce contention at DSS-14 for DSS Maintenance and Mars Odyssey.

Mars Odyssey did not accept the recommendation to reduce seven 8-hour stand-alone Mapping passes to two 4-hour supports in Weeks 06 and 09, and to reduce five 4-hour supports in Week 07 and 08. Mars Odyssey/MER-A did not accept the recommendation to reduce its seven 8-hour MSPA supports to three 8-hour and four 4-hour supports in Week 06 and 09. MER-A/Mars Odyssey did not accept the recommendation to reduce its seven 8-hour MSPA supports to three 8-hour and four 4-hour supports in Week 06 and 09. The Mars Program Office, Charles Whetsel accepted an action to investigate contention and provide resolution under AI #7.

Ulysses agreed to reduce support to fourteen 8-hour passes per week, but stressed maintaining continuous coverage on a best effort basis.

Note: Jupiter Closest approach is in Week 06, February 5 (DOY 036) and the radial and meridional alignment is in Week 09, February 27 (DOY 057). The Ulysses operations plan is to turn the spacecraft recorder off in Week 04, January 22 (DOY 022) and turn it back on in Week 11, March 11 (DOY 70). Ulysses, Bruce Brymer stated, “We need to secure the recorder in order to have the power to supply all the scientific instruments aboard the spacecraft for these historic events. Any significant lesser support would be futile. Without the continuous downlink support the recorder must stay on, therefore some instruments would have to stay off”.

WIND agreed to move all support to DSS-34 to accommodate Ulysses, GNS, and Mars Express on the 34B1 subnet.

Voyager 2 agreed to reduce support to seven 8-hours at DSS-34 and DSS-45 to 6 hours to accommodate Ulysses, WIND, GNS, and SDU.

2004 Contention Period - March - Weeks 10 - 13

GSSR agreed to reduce Week 11 Mercury request to 3 hours in duration.

Mars Odyssey agreed to reduce 4 stand-alone passes to 4 hours in Weeks 11 - 13.

Polar agreed to move support in Week 11 from 34BWG1 to 26m.

SOHO agreed to move TSO support to Week 10 and to delete all support requested on the 34B1 in Week 11 and to restore nominal support request for Week 11 on the 26m.

2004 Contention Period - April - Weeks 14 - 18

GSSR agreed to delete Mercury observations requested in Weeks 15, 16, and 18.

Ground Based Radio Astronomy agreed to reduce 70m Host Country support to 8-hours in Week 15 and 16, and to reduce DSS-45 support to 8 hours in Week 17.

Mars Odyssey agreed to reduce 4 stand-alone passes to 4 hours.

Mars Global Surveyor agreed to move 3 passes per week from the 34H to the 34B1.

SGP did not agreed to the recommendation of reducing DSS-45 Crustal Dynamics support in Week 15 from 24 hours to 8 hours, but did agreed to reduce support to 12 hours.

2004 Contention Period - May - Weeks 19 - 22

DSS Maintenance agreed to reduce one DSS-14 8-hour routine maintenance to 6 hours, and reduce one DSS-63 10-hour routine maintenance to 8 hours, in Weeks 21 and 22 to accommodate Mars Odyssey, MER-A, and MER-B MSPA supports.

DSN Antenna Cals agreed to delete support in Weeks 21 and 22 to accommodate Mars Odyssey, MER-A, MER-B MSPA supports, DSS Maintenance, and GSSR.

EVN E500 J-M4 agreed to split support into two 8-hour increments to accommodate Mars Odyssey, MER-A, MER-B MSPA supports, DSS Maintenance, and GSSR.

Ground Base Radio Astronomy agreed to move RA500 SOC-M4 support to Week 23 and split support into three 8-hour increments to accommodate Mars Odyssey, MER-A and MER-B MSPA supports, DSS Maintenance, and GSSR. Ground Base Radio Astronomy agreed to delete M-Wave Spect and Planet R/AST in Week 21 and 22 to accommodate Mars Odyssey, MER-A and MER-B MSPA supports, DSS Maintenance, and GSSR.

Gravity Probe B agreed to reduce DSS-14 support to 8 hours in week 21 to accommodate Mars Odyssey, MER-A, MER-B MSPA supports, DSS Maintenance, and GSSR.

Goldstone Solar System Radar agreed to reduce the Mercury observation support in Week 21 from 5.9 hours to 3 hours to accommodate Mars Odyssey, MER-A, MER-B MSPA supports, DSS Maintenance, and GPB.

Mars Odyssey did not accept the recommendation to reduce 3 supports to 4 hours to accommodate DSS Bearing and Routine Maintenance. Mars Odyssey agreed to MSPA with Mars Express and Mars Global Surveyor at DSS-63.

Mars Express agreed to schedule Bi-static R/S support at DSS-63 only.

Mars Global Surveyor agreed to requested support using DSS-15, DSS-45, 34BWG1, and 34BWG2 while accommodating DSS Maintenance.

Nozomi agreed to schedule two supports at DSS-63 and one support at DSS-14 to accommodate Mars Odyssey, MER-A and MER-B MSPA supports, DSS Maintenance, GPB, and GSSR.

Polar agreed to requested support using 26m and DSS-34.

SOHO HSO agreed to requested support using 26m, 34HSB, and 34B1.

SGP Crustal Dynamic did not accept the recommendation to delete support, but did agreed to move SGP support to August of 2004.

WIND agreed to requested support using DSS-24, 34.

2004 Contention Period - June - Weeks 23 - 26

Cassini agreed to use maximum view at DSS-25, and to reduce DSS-45 from 8-hour supports to 4 hours for TCM Day support. In addition, Cassini agreed to use 8-hour supports at DSS-54, 55 to accommodate DEEP Impact.

Deep Impact agreed to use DSS-15, 45, 34 to accommodate Cassini.

DSS Maintenance agreed to reduce DSS-24 support from 8 hours to 6 hours in Week 25 and 26 to reduce contention on the 34M subnets and to accommodate Cassini, Deep Impact, MER-B Surface U/L, Mars Global Surveyor Mapping and GBRA activity. DSS Maintenance agreed to reduce DSS-45 from 6 hours to 5 hours and to reduce DSS-14 routine maintenance from one 8-hour to one 6-hour support in Week 23 and 26. This recommendation is to reduce contention on the 34M subnets and to accommodate Cassini, Deep Impact, MER-B Surface U/L, Mars Global Surveyor Mapping and GBRA activity.

Ground Base Radio Astronomy Host Country agreed to change its 12-hour support to two 8-hour supports to reduce contention on the 34M subnets and accommodate Cassini, Deep Impact, MER-B Surface U/L, and Mars Global Surveyor Mapping.

Mars Odyssey Mapping agreed to reduce three supports from 8 hours to 4 hours in Weeks 23 and 26, to reduce four supports from 8 hours to 4 hours in Week 24, and to reduce five supports from 8 hours to 4 hours in Week 25 to accommodate DSS Maintenance.

Mars Express agreed to use DSS-14 in Week 23, and to use DSS-63 in Week 24 and Week 26 for Bi-static R/S support. Mars Express agreed to use planed Occultation and Orbital Science supports (sum of 16 hours) at DSS-24 and 54 in Weeks 25 and 26

Nozomi agreed to plan two supports at DSS-14 and one at DSS-63 in Week 23 and plan two supports at DSS-63 and one at DSS-14 in Week 24 and 26 and to accommodate Mars Odyssey, Mars Express, and DSS Maintenance.

Polar agreed to requested support using DSS-27, 46, and 34B1.

SOHO HSO agreed to requested support using the 26m subnet, DSS-27 and 24.

Voyager 2 agreed to use 5 split passes at DSS-45 and 34 and seven 8-hour passes at DSS-43, 45, 34.

2004 Contention Period - July - Weeks 27 - 31

CONTOUR agreed to use split passes of 4 hours each at DSS-43, 63 (viewperiod at DSS-63 is approximately 4 hours) for requested support.

DSN Antenna Calibration agreed to reduce support to 4 hours in Weeks 27 - 29.

DSS Maintenance agreed to delete DSS-14 Bearing and two Routine Maintenance in week 27, (DSS-14 is scheduled for downtime starting in week 27 and continuing through week 31) and to delete DSS-63 6-hour Routine Maintenance in week 27.

Mars Odyssey agreed to reduce three passes to 4 hours in Week 27 and reduce support from eleven 7-hour to seven 8-hour and two 5-hour supports in Week 29. Mars Odyssey will offset this reduction by increasing from eleven 7-hour supports to ten 8-hour and one 5-hour supports in Weeks 28, 30, and 31.

Mars Express agreed to requested support using DSS-24 and 54 for Occultation support in Week 27 and 28.

Polar agreed to requested support using the 26m subnet and DSS-27.

SOHO HSO agreed to requested support using the 26m subnet and DSS-27.

Voyager 1 agreed to requested support using DSS-25, 65, and 55.

Voyager 2 agreed to requested support using DSS-45 and 43.

2004 Contention Period - August - Weeks 32 - 35

The contention level is workable and should resolve during final schedule preparations and negotiations.

2004 Contention Period - September - Weeks 36 - 40

The contention level is workable and should resolve during final schedule preparations and negotiations.

2004 Contention Period - October - Weeks 41 - 44

The contention level is workable and should resolve during final schedule preparations and negotiations.

2004 Contention Period - November - Weeks 45 - 48

The contention level is workable and should resolve during final schedule preparations and negotiations.

2004 Contention Period - December - Weeks 49 - 53

The contention level is workable and should resolve during final schedule preparations and negotiations.

2005 Contention Period - January - Weeks 01 - 04

Mars 01 Odyssey agreed to move DSS-54 support to DSS-55 in Weeks 01-03 to resolve extreme contention caused by Mars Express Occultation and Orbital Science and Mars 01 Odyssey supports in Weeks 01-03.

2005 Contention Period - February - Weeks 05 - 08

The contention level is workable and should resolve during final schedule preparations and negotiations.

2005 Contention Period - March - Weeks 09 - 13

Mars Express agreed to move DSS-54 support to DSS-55 in weeks 10-13 to resolve moderate contention in weeks 10-13 caused by Mars Express Orbital Science, Deep Impact Cruise support at DSS-24, 54 and Mars 01 Odyssey support at DSS-15, 34 and 54.

2005 Contention Period - April - Weeks 14 - 17

SGP agreed to move support from Week 17 to Week 14 to resolve moderate contention in week 17 at DSS-15 caused by Deep Impact Trajectory Correction Maneuver, Voyager 1 DTR Array and maintenance compounded by DSN M&E and SGP 24-hour support.

2005 Contention Period - May - Weeks 18 - 21

The contention level is workable and should resolve during final schedule preparations and negotiations.

2005 Contention Period - June - Weeks 22 - 26

DSS agreed to reduce DSS-27 routine maintenance from 8-hours to 6-hours in week 26 to resolve severe contention at DSS-27 between Maintenance and SOHO HSO support in week 26.

2005 Contention Period - July - Weeks 27 - 30

DSS agreed to reduce DSS-27 routine maintenance from 8-hours to 6-hours to resolve severe contention at DSS-27 between Maintenance and SOHO HSO continuous support.

2005 Contention Period - August - Weeks 31 - 34

DSS agreed to reduce DSS-15 and DSS-27 maintenance from 8 hours to 6 hours to accommodate moderate contention in Weeks 32-34 on the 34H caused by Voyager 1, Cassini, Mars Reconnaissance Orbiter Launch and TCM and Routine Maintenance.

GSSR Asteroid 19922UY4 agreed to plan supports to accommodate VOYAGER 1 MAGROL on DOY 218.

2005 Contention Period - September - Weeks 35 - 39

DSS agreed to reduce DSS-27 routine maintenance from 8-hours to 6-hours in Weeks 35 to 38 to resolve severe contention at DSS-27 between Maintenance and SOHO HSO continuous support in Weeks 35-38.

2005 Contention Period - October - Week 40 - 43

The contention level is workable and should resolve during final schedule preparations and negotiations.

2005 Contention Period - November - Weeks 44 - 47

Mars Express agreed to use DSS-24 and DSS-63 in Weeks 46 and 47 to resolve a moderate contention caused by Mars Odyssey, Mars Express Orbital Science, and Stereo Ahead and Stereo Behind Launch support at DSS-54.

Mars 01 Odyssey agreed to move support to the 70m in week 46 and 47 to resolve a moderate contention in week 46 caused by Stardust TCM, and Stereo Ahead and Stereo Behind support on the 34B2.

Stardust agreed to move 2 TCM passes to DSS-15, and DSS-65 in Week 46 to resolve a moderate contention caused by Mars Odyssey, Stereo Ahead and Stereo Behind Launch support on the 34B2.

Voyager 1 agreed to move two passes to DSS-15 and DSS-65 in Week 46 to resolve moderate contention at DSS-26 and DSS-55 caused by routine maintenance.

Voyager 2 agreed to reduce routine support to seven 8-hour passes and to use DSS-43 in Week 46 to resolve moderate contention caused by DSS maintenance, Mars Reconnaissance Orbiter, and Stereo Behind Launch support at DSS-45.

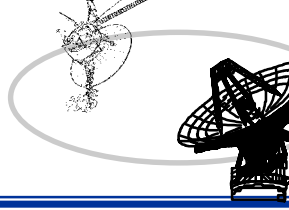
2005 Contention Period - December - Weeks 48 - 52

Mars 01 Odyssey agreed to move support from DSS-54 to DSS-55 in Weeks 48 to 51 to resolve severe contention caused by Mars Express Occultation, and Orbital Science, Mars 01 Odyssey, and Stereo Behind Maneuver on the 34BWG1.

Mars 01 Odyssey agreed to move support from DSS-34 to DSS-45 in Week 49 and 52 to resolve severe contention caused by Stereo Ahead, Mars Reconnaissance Orbiter TCM, Mars 01 Odyssey, and Stereo Behind Maneuver at DSS-34.

Stereo Ahead agreed to move Maneuver support from DSS-25 to DSS-15 in Week 48 and 52.

Stereo Behind agreed to move Maneuver support from DSS-45 to DSS-43 in Week 49.



Resource Allocation Team Link to “Redbook”

JPL

Napoleon Lacey